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(*Concluded from p. 605.*)

The Hæmolytic Anæmia of Pregnancy.

In opening a discussion of the hæmolytic anæmia of pregnancy one enters a field of the greatest confusion and controversy. Few diseases have a more copious and less critical literature and there is need for more coöperation between obstetrician and hæmatologist in its study. A mild anæmia is physiological during and after gestation and all forms of anæmia are aggravated at this time. There seems to be no form of anæmia, however grave, in which pregnancy has not been recorded. The chronic microcytic anæmia, so common in women in temperate zones, and the macrocytic anæmia of the tropics, both reach their most extreme severity in the pregnant woman. Infection at labour may allow the passage into the blood stream of hæmolytic organisms which rapidly induce a profound anæmia. Nevertheless for over a century it has been realised that there is a severe anæmia of pregnancy which affects women who were in perfect health before conception, which occurs in the absence of any sign of infection, and which disappears completely if the patient survives her pregnancy and puerperium.

It is a rare disease. Beckmann (1921) found only six cases in 60,000 births in Vienna and two of these six cases certainly were not hæmolytic anæmia. Investigation of the records of over 4000 labours conducted at Queen Charlotte's Maternity Hospital in 1926 and 1927 failed to disclose a single case.[22] Only one case has been recorded at Guy's Hospital in the last ten years. On the other hand many cases must be missed, as is shown by the large number of cases which individuals interested in the disease have personally studied, and by the appearance of cases in a district or hospital coincident with the development of an interest in hæmatology. The disease occurs in primiparæ and multiparæ, and at all periods of the reproductive life. Analysis of the age and parity of women affected shows little difference from the findings in a group of normal pregnant women or in other accidents and complications of childbirth. Primiparæ are more susceptible than multiparæ, but the difference is not great. The disease has no relationship with the toxæmia of pregnancy or with puerperal infection. It is true that œdema and a moderate albuminuria are present in many of these anæmic women, and that they are exceptionally prone to intercurrent infection, but there is no more intimate connexion than this. Nevertheless the clinical resemblance may be great, and as hæmolytic anæmia is rare, it is only natural that it should often have been confused with these much more common maladies of pregnancy, toxæmia, and infection.

CHARACTERISTICS OF THE ANÆMIA.

By the time the patients seek medical advice they are already profoundly anæmic. The early symptoms of the disease are overlooked or regarded as the ordinary discomforts of pregnancy. The anæmia increases fast as the disease approaches its climax. Extreme dyspnœa, œdema, syncopal attacks, transient blindness or paralysis, causeless hæmorrhage, uncontrollable vomiting or diarrhœa, one or more of the symptoms at last makes the patient aware that this is no normal pregnancy. The attendants are alarmed by the death-like pallor and examination of the blood reveals a severe megalocytic anæmia. The temperature is raised throughout the period of anæmia, falling to normal when improvement begins, whether spontaneously or as the result of treatment. The pallor has an icteric tinge but overt jaundice is most unusual. Urobilin is present in the urine and the indirect van den Bergh reaction is positive. Filo found that the excretion of bilirubin derivatives in the urine and fæces was increased up to three times the normal. In one case in which he made a series of estimations before and after confinement, the bilirubin excretion sank rapidly from three times the normal to subnormal at a time when the red cells were still falling; with improvement in the blood picture the bilirubin excretion was finally stabilised at the normal level. The spleen is palpable in little more than a third of all cases. In size it varies from being only just palpable to extending three or four inches below the ribs. It vanishes beneath the costal margin on repair of the anæmia. There is no evidence that enlargement of the spleen can be taken as a favourable prognostic sign, as has been suggested.[2] The liver is enlarged in a smaller fraction of cases, usually in association with the spleen but sometimes alone. Earlier writers regarded syphilis as an important ætiological factor, but its importance is not substantiated either by the clinical and post-mortem findings or by Wassermann's reaction. In 43 cases where this reaction was recorded, 35 were negative, 2 doubtful, and only 6 positive. Nor is there any instance in which antisyphilitic treatment has favourably influenced the course of the disease.

The anæmia is of the plastic type with signs of rapid regeneration of red cells, polychromasia, punctate basophilia, and nucleated red cells. The regenerative phenomena reach a climax with the remission, complete or incomplete, which occurs after labour, but they are also present before. Absence of signs of regeneration, especially after confinement, is a finding of ill omen. The fragility of the red cells seems usually to be increased as long as the patient is pregnant (Table II.). After confinement the fragility returns to normal even though the anæmia persists. The white cells are normal or increased by a polynuclear leucocytosis. A few myelocytes are found in practically every case, and they may produce a leukanæmic blood picture. Platelets are always diminished when the anæmia is severe and they may be practically absent. They rapidly return to normal values when the anæmia remits. Purpura and external hæmorrhage occur in about one-third of the cases, and there may be bleeding from the nose, the gums, or the gastro-intestinal tract. There may be vaginal hæmorrhage before the baby is born, but curiously enough the blood loss at confinement is less than normal.

Reticulocytosis before confinement was noted by Minot and by Peterson, while Evans's patient had 40 per cent. about the tenth day of the puerperium before any treatment had been given. Large numbers of megaloblasts were noted before labour by Jungmann and by Brault.

* The third Goulstonian Lecture for 1932 delivered before the Royal College of Physicians of London on March 8th.

Petersen and Dyke found mean diameters of the red cells of 7·72, 8·0, and 8·46 microns. Larrabee and Wintrobe found the mean corpuscular volume increased. Price-Jones curves showing a considerable shift to the right are figured by Parvu and Fouquiau, and by Hampson and Shackle. It is unusual for the white count to be above 15,000 before labour, and high values after labour are sometimes ascribable to puerperal infection. Nevertheless a patient reported by Fabre and Trillat had 17,000 white cells per c.mm. a week before confinement, and Lenner's patient had 45,000 white cells per c.mm. with 22 per cent. of monocytes and myelocytes at the onset of labour. Large numbers of myelocytes and myeloblasts in patients who recovered are reported by Benda, Bruggemann, and Jungmann. Of great interest in early cases is the colour-index, which in Drexel's patient was high from the start. In five other cases with initial red cell counts above 2·5 millions, it was high in two (Meaker, Murdoch) and 0·7 or lower in three (Esch, Minot, Pohl). There is a good deal of evidence that the colour-index is often low at the onset, rising as the malady progresses. When the anæmia is established, the colour-index is high unless there are complications such as hæmorrhage or infection. In isolated cases the colour-index has been low throughout, though the diagnosis has been proved at post-mortem.

TABLE II.

Author.	Before confinement.	After confinement.
Vallois et C. de C. ..	60/40	Normal.
Vermelin et Vigneul..	90/425	Approx. normal.
Ecalle..	—	Normal.
Jousselin	72/40	—
Tchertkoff	—	Normal.
Parvu..	—	—
Evans..	—	50/
Devraigne	50/45	—
Lenner	52/42	—
Minot..	54/32	Normal.
Oettingen	—	47/43
Petersen	—	60/
Petersen	Normal.	—

SYMPTOMS AND COURSE OF ILLNESS.

Digestive symptoms, stomatitis, glossitis, pharyngitis, vomiting, and diarrhœa are among the most prominent symptoms of the hæmolytic anæmia of pregnancy. It is usually difficult to date their onset, as they may follow and be inseparable from the dyspeptic troubles of the early months of pregnancy. It is probable that they do not appear till after the anæmia has developed. Most recorded early cases of hæmolytic anæmia of pregnancy have been discovered by accident in the course of a routine investigation, and the patient has had no gastro-intestinal symptoms. There are many cases in which these symptoms have first been noticed at the time of an aggravation of the anæmia during the puerperium. The inflammations about the mouth are sometimes a simple reddening and vesiculation of the mucosa, but in other patients they are ulcerous, necrotic, foul-smelling lesions. Anal gangrene has also been described. Such lesions are of course common in many cachectic states. One must therefore conclude that the gastro-intestinal disturbances are secondary to the anæmia and not primary or causative, though one must confess that their resemblance to the gastro-intestinal disturbances of pernicious and allied anæmias can be very striking.

In recent years there has been a tendency to believe that achlorhydria is present and plays an ætiological rôle in the hæmolytic anæmia of pregnancy. This belief is false and is easily traced to errors in diagnosis and to a misunderstanding of the literature. Achlorhydria is frequent in the chronic microcytic anæmia of women and in tropical macrocytic anæmia. Both of these maladies are made worse by pregnancy and are then often confused with the true hæmolytic anæmia, though they differ from it in history, symptoms, pathology, treatment, and future course. Putting aside all such cases, one finds that achlorhydria is uncommon in the hæmolytic anæmia of pregnancy and cannot be an ætiological factor, as is clear from the following table. Not all these meals were fractional, and the true incidence of achlorhydria is probably lower than 33 per cent. In a few instances a temporary depression of gastric secretion has been observed in the period of profound anæmia.[25 65]

TABLE III.

Author.	Normal.	Achlorhydria.	Author.	Normal.	Achlorhydria.
Dyke ..	2	—	Heim ..	1	—
Filo ..	2	1	Powell-Davy	—	1
Jungmann..	1	—	Roth ..	—	1
Halir ..	1	—	Weinberg ..	—	1
Rowland ..	1	—	Beyer-Gurowitsch	—	1
Peterson ..	3	—	Schüpbach ..	1	1
Evans ..	1	—			
Benda ..	1	1		14	7

The disease begins usually in the third trimester of pregnancy, but a few cases have been diagnosed as early as the fourth month and a much greater number have no symptoms until the puerperium. Drexel's case is of great interest not only because of the early diagnosis but also because of the data on the rate of development of the anæmia:—

A primigravida, aged 21, was admitted to hospital at the fourth month for pyelitis. The pyelitis cleared up in a few days but she remained pale and ill, and indeed undue fatigue and anæmia became more oppressive. It was elicited that she had always been healthy and strong up to the onset of her pregnancy, since when she had become pale. The liver and spleen were not palpable, but there was a moderately severe anæmia with a colour-index of 1·0. In spite of treatment with arsacetin injections the anæmia steadily worsened, myelocytes and normoblasts appeared in the peripheral blood, anorexia and vomiting set in, and there was an attack of collapse and unconsciousness lasting two hours. Her hæmoglobin having fallen to 25 per cent., her pregnancy was terminated by operation at the sixth month, some ten weeks after admission. She then made a rapid and spontaneous recovery, pathological cells disappeared from the blood and the anæmia was repaired.

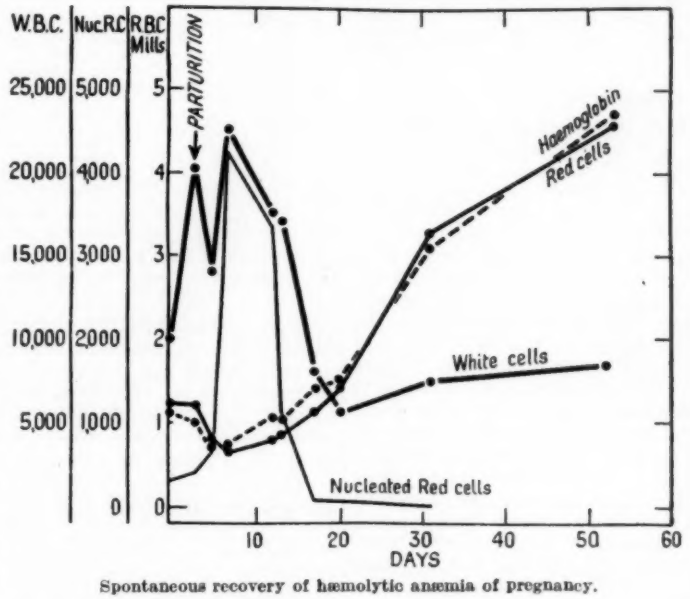
TABLE IV.

Date.	R.B.C.	Hb. %.	Remarks.
Sept. 4th	—	60	Four months' pregnant.
,, middle	3,000,000	60	—
Oct. middle	—	50	—
Nov. 1st	2,000,000	38	—
,, 6th	—	33	—
,, 7th	—	—	Collapsed and unconscious two hours.
,, 9th	1,500,000	28	Myelocytes and normoblasts.
,, 15th	—	25	Pregnancy interrupted.
,, 30th	1,900,000	28	—
Dec. 7th	—	35	No pathological cells.
,, 17th	—	45	—
,, 28th	—	60	—
Jan. 10th	3,800,000	64	—

It is usually said that the anæmia becomes progressively worse during pregnancy and reaches a crisis in labour or the puerperium, which is either fatal or is followed by spontaneous recovery. This is certainly true of most of the cases which begin about the sixth or seventh month of pregnancy. Cases beginning before the sixth month often terminate in premature delivery, spontaneous or induced. Patients who have no symptoms till labour or the puerperium may remain anæmic for a long time after confinement, as in the very interesting series of cases described by Larrabee. One of these was

first seen four months after confinement and died five months after confinement; another did not come under treatment until seven months after confinement. The disease arises only during pregnancy and never regresses before the expulsion of the fœtus. The natural duration of the disease might be placed between three and twelve months. The strain of labour causes an exacerbation. After labour the disease terminates with an outpouring of immature red cells and rapid regeneration of the blood, but the reparative phase may be postponed for weeks or months after delivery. In Fig. 3 I have summarised the data from a 5-para, aged 29, reported by Jungmann. Her illness began about the eighth month and she was first seen a few days before delivery. No specific treatment was given. The exacerbation after labour and the spontaneous recovery with outpouring of normoblasts and megaloblasts are well shown.

FIG. 3,



Spontaneous recovery of hæmolytic anæmia of pregnancy.

Estimates of the mortality of the hæmolytic anæmia of pregnancy have steadily fallen as more cases have been collected and the death-rate of all cases reported since 1917 works out at 30 per cent. Post mortem there is œdema, anæmia, and fatty degeneration of the viscera, the spleen is enlarged, the liver shows hæmosiderosis, the bone-marrow is hyperplastic, myeloid and erythroblastic tissues are increased, and megaloblasts are present. Recovery is complete and permanent. Two of Naegeli's patients have now been under observation and remained well for thirty years. Should the patient become pregnant again however, the risk of relapse is considerable. Even one authenticated relapse would be important in a disease so rare as this. Actually the literature contains more records of relapses in subsequent pregnancies than of normal confinements.

TREATMENT.

Many drugs have been used in the treatment of the hæmolytic anæmia of pregnancy, iron, arsenic, and hydrochloric acid being the favourites, but none of them appears to have done any good. Transfusion was the only effective remedy before treatment by liver was introduced, and it remains the first remedy for patients in extremis. Four to five hundred cubic centimetres of blood should be given at a transfusion and the operation should be repeated at short intervals of time until a remission is induced. Before confinement the effect of transfusion is temporary, and it has no power to arrest the disease while the fœtus is in the uterus. After parturition it is nearly always followed by complete and rapid cure, if the patient is not too collapsed and if sufficient blood is injected. Nevertheless one of Filo's patients died five months after parturition in spite of four transfusions.

Liver has been given in many of the cases reported in recent years and the results are often quoted as proof of its curative power. It is surprising how few of the publications can be so construed. Usually liver treatment has been combined with transfusion, or it has not been prescribed till the patient was already recovering, or exact hæmatological details are lacking. Conclusive proof of the value of liver is scanty. In a few cases, however, it has been possible to arrest the progress of the anæmia before confinement, which was a very rare event before the introduction of liver therapy, and in other cases, in which the anæmia has remained torpid after confinement, treatment by liver has brought about speedy improvement.

Beckmann (1928) treated two women by parental injection of liver extract and they were able to go to term. In the case separately reported by Dyke and by Stewart and Harvey, the disease was arrested two months defore delivery by a transfusion followed by pil. ferri. grs. 5, b.d., and Liveroid 2 oz. in die. A similar case in which liver treatment was supplemented by three transfusions and the disease was arrested three months before delivery was reported by Deschamps and Froyez, and by Devraigne and Laennec (same case). Peterson's patient, who had gone downhill in spite of two transfusions, rapidly improved before delivery on a diet containing half a pound of liver a day. On the other hand, Meaker and Bongiorno failed to arrest the disease by injection of liver extract before confinement, and Wery found iron and liver ineffective in a patient who ultimately recovered after premature delivery and transfusions. The majority of the publications concern the administration of liver after delivery, and are vitiated by the absence of control periods, by the use of other forms of treatment, and by the natural tendency of the disease to get well. Nevertheless good evidence of the value of liver is provided by the following two cases. A patient of Peterson first came under treatment two months after delivery; there was a clear reticulocyte crisis and steady improvement after the administration of liver. In Lenner's patient an anæmia with high colour-index had persisted for ten months after delivery, and she likewise improved on treatment with liver.

The advisability of operative interference is still unsettled and the question waits an answer till we know more of the value of liver before confinement,

especially by injection. With other methods of treatment no lasting improvement can be expected before confinement, but the shock of operation is often mortal. It is well to remember that the disease is not so lethal to the mother as was once held, and that the majority of the babies do well. On surveying the literature I have been surprised to learn how often women who seemed moribund have spontaneously delivered themselves and recovered; and I have been impressed by the high mortality of operative interference. The conservative physician will be strengthened in his decision by the following report [8]:—

The patient was admitted to hospital at the seventh month of pregnancy with a blood count of 750,000 red blood-cells per c.mm., hæmoglobin 25 per cent., colour-index 1·6. She refused treatment and was sent home to die. This was a journey of 70 miles over the rough mountain roads of Greece. Three days after her return she had an easy abortion and quickly got up and resumed her household tasks. She thereupon contracted pneumonia but was back at work again in three weeks, and since then has been in good health.

Discussion.

When we recapitulate the data I have collected we find good reason to separate the hæmolytic anæmias from pernicious and allied anæmias, and to subdivide the hæmolytic anæmias into acute and chronic forms. Acute hæmolytic anæmia and the hæmolytic anæmia of pregnancy differ from pernicious and allied anæmias in the absence of any nutritional or digestive defect, in the fever and general constitutional disturbance, in the regenerative character of the anæmia with reticulocytosis and leucocytosis, in the fluctuations in the resistance of the red cells, and in the self-limited course. They differ from chronic hæmolytic anæmia in clinical features, natural history, and response to treatment. They may be so acute that hæmoglobinuria develops, or they may be subacute and torpid, but death or spontaneous recovery occurs within a period rarely longer than a year. On the other hand we must be impressed by the close resemblance of acute hæmolytic anæmia and the hæmolytic anæmia of pregnancy. Every feature of the one disease is duplicated in the other, and they differ only in the fact of pregnancy. For the peculiar frequency of a disease in youth and in pregnancy we have a parallel in acute yellow atrophy of the liver. For the initiation or recrudescence of an anæmia in pregnancy we have a parallel in the bartonella anæmia of experimental animals, which may only develop under special conditions, such as after splenectomy or after artificial hæmolysis, though the micro-organisms were previously present in the host. There is no valid reason in pathology for the separation of acute hæmolytic anæmia and the hæmolytic anæmia of pregnancy, and every symptom points to their identity.

To-day one can do no more than present this group of cases and demonstrate their natural features and course. If they are due to infection, as seems probable from the clinical picture, we must look for a different organism from the pyogenic cocci, something perhaps more akin to bartonella. I know no other human infection which responds in this way to transfusion or liver, but there is evidence that *Bartonella muris* can be cured by liver.[78] Writers on the hæmolytic anæmia of pregnancy have referred to the acceleration of blood breakdown and repair entailed by pregnancy, and the hæmolysis of maternal corpuscles in the placenta and elsewhere to supply hæmopoietic material for the fœtus. They have felt that hæmolytic anæmia in pregnancy may be a morbid exaggeration of this process, such as I have already described in icterus gravis neonatorum, and the serum has many times been examined for hæmolysins, but without success. It is a possible but unlikely explanation of all these acute anæmias that they are breakdowns of the normal rhythm of erythropoiesis and erythrolysis, comparable with a disturbance in the rhythm of the heart-beat and that the fever and constitutional disturbance are secondary effects. It has been my aim in this lecture not to construct theories, but to bring together a great number of scattered observations and to show the common characteristics of these acute anæmias.

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TREATMENT OF CLONIC FACIAL SPASM.

(*a*) BY ALCOHOL INJECTION.

(*b*) BY NERVE ANASTOMOSIS.

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TRUE clonic facial spasm is a unilateral, intermittent, or clonic series of contractions of the facial muscles, limited to one side, though not affecting the whole facial musculature to an equal degree. When once developed, spontaneous cure of clonic facial spasm is unknown.

Somewhat commoner in the female sex, the facial spasms are a source of considerable worry to the sufferers from this complaint, especially from the contractions of the orbicularis palpebrarum, or blepharospasm, causing the appearance of winking. Moreover, the sudden closure of the eye may interfere seriously with vision, as in crossing traffic, with consequent danger to life.

The onset of the spasms varies in severity and frequency, some days being comparatively free, while at other times the annoyance is excessive, aggravation being perhaps induced by nervousness or excitement. During sleep the spasms always cease. Usually these commence in the orbicularis palpebrarum, causing blepharospasm, at first slight and not to be distinguished from the intermittent contractions of this muscle which are personally familiar to many of us, and are sometimes spoken of as "live blood," and are especially liable to be brought on by fatigue. In true facial spasm, however, the muscular contractions gradually spread to other facial muscles on the same side, especially those around the angle of the mouth, and ultimately every muscle supplied by the facial nerve of one side may share in the clonic contractions, including the frontalis and platysma, and even the stapedius may be affected, the contractions being accompanied by clicking noises in the ear. This unilateral distribution of the muscular spasms distinguishes clonic facial spasm from spasmodic tic and psychomotor blepharospasm, habit spasms, chronic chorea, and other intermittent grimacing of psychical origin.

Causes of Condition.

The pathology of clonic facial spasm is unknown, though it is probably due to some form of degenerative neuritis, possibly in the neighbourhood of the geniculate ganglion, for in a well-marked case of some years' duration, it is always easy to demonstrate facial nerve weakness, contracture, and overaction on that side. Moreover, occasionally, a moderately severe *facial Bell's palsy* may be followed, in addition to the usual contracture, by well-marked clonic facial spasm (Fig. 1), indistinguishable in type and severity from that which is of gradual onset.

Undoubtedly clonic facial spasm is due to some chronic lesion or degeneration of the lower facial neuron, and is not of cortical origin, as is suggested by Gibson, who considers it as exactly parallel to spasmodic torticollis. In the latter disease the spasm is a rotary movement of the head to one side produced by the contraction of the sternomastoid of one side associated with the posterior rotators on the opposite side, in which several nerves are concerned, and no weakness of these muscles is to be detected between the spasms. In clonic facial spasm the contractions are limited to the musculature supplied by one facial nerve alone, in severe cases practically every muscle, including the platysma and stapedius, being involved.

Local injuries to the parotid region or cheek may also cause clonic spasm later on of some of the facial muscles on one side, probably due to the scarring involving facial nerve branches. No doubt such a case would not benefit by facio-hypoglossal anastomosis, as the scarring is peripheral to the site of the anastomosis.

Hemispasm of the face may occur in *cerebral lesions*, as in general paralysis, the lower quadrant of the face being chiefly involved in the spasm, and occasionally the whole facial nerve may be irritated by the presence of a *basal tumour* causing attacks of facial spasm, as has been observed in cerebellar tumour. Facial spasm has also been many times noted as a sequel to *encephalitis lethargica*.

A very remarkable combination of clonic facial spasm is occasionally met with in paroxysmal *trigeminal neuralgia*, which was described by one of us (W. H.) in 1926.

In one case, a woman aged 58, who was seen in 1921, clonic right facial spasm had commenced 30 years previously, ultimately involving the whole facial musculature of the right side, without any pain until five years before, when typical paroxysmal trigeminal neuralgia commenced. Alcohol injection of the right foramen ovale and foramen rotundum anæsthetised the second and third trigeminal areas and arrested the pain completely, but the clonic facial spasms continued unaltered until the branches of the facial nerve were injected with alcohol at the posterior border of the mandible, two days later. Ten months later, however, the clonic facial spasms were commencing to reappear, though there was no recurrence of the neuralgia.

In another case, a woman aged 52, clonic left facial spasm had developed two years previously, though paroxysmal neuralgia had commenced only five months before she was seen in May, 1916, the painful spasms then being intense, both by day and night. Injection of the Gasserian ganglion was done, which completely cured the neuralgia, which was still absent 5½ years later, though the spasmodic facial twitchings continued unaltered.

The association of clonic facial spasm with paroxysmal trigeminal neuralgia is difficult to understand, as they arise independently, and cure of the one does not affect the other. Yet they are invariably on the same side of the face, which certainly points to some real association and not coincidence. Cushing has described three cases of clonic facial spasm associated with paroxysmal trifacial neuralgia on the same side, in which Gasserian operation did not benefit the pain, but in one of which the pain disappeared after a subsequent section of the facial nerve. We have never met with such a case, though we have seen the associated pain and facial spasm in at least a dozen cases, all of which responded in the usual way to alcohol injection.

Paraspasm, or bilateral clonic spasms of the

median musculature of the face, has been described by Sicard and Haguenau. It is clearly of cerebral origin, and is probably allied to the tics and habit spasms. These are easily distinguished from true clonic facial spasm, which is almost invariably unilateral.

Bilateral *blepharospasm* also is a psychomotor reflex, which may be started by sudden exposure to bright light, or the irritation from conjunctivitis or snow blindness, and it may also become chronic after the emotional reflex of a bout of crying. Sometimes it may be cured by local nerve injection or section, but psychotherapy should always first be employed.

Treatment.

The treatment of clonic facial spasm has in the past been most unsatisfactory. Electricity and massage are worse than useless, as also are blisters and other counter-irritants applied behind the ear. Exposing the facial nerve by open operation behind the angle of the jaw, and then stretching the nerve has been tried in the past, with only temporary success. Simple division of the nerve will arrest the spasm for a time, by producing complete facial paralysis, but recovery is almost certain to take place, owing to some re-establishment of conduction of the nerve-fibres, with consequent return of the clonic spasms. The degree of deformity in the case of a freshly divided nerve in these cases is not nearly so intense as would result in a recent case of total facial palsy from other causes, because, as we said above, there is always present in long-standing cases a certain amount of facial contracture, which diminishes the amount of facial deformity produced by section of the nerve.

Recently, Frazier has advocated his method of dividing by open operation the nerve-fibrils to the orbicularis palpebrarum and corrugator for the treatment of blepharospasm. Incisions are made across the zygoma in front of the parotid, but these must produce at best scars unpleasant for a female subject, and would not affect the spasms of the angle of the mouth or of the remaining musculature.

Alcohol injection of the nerve at its exit from the stylomastoid foramen has been tried, without good results. If the nerve is properly hit, the facial paralysis will be as severe as if the nerve were cut, though recovery will ultimately take place, with recurrence of the clonic spasms. It is by no means an easy matter to inject the stylomastoid foramen, and searching for the foramen is usually a very painful process.

A method of alcohol injection (Schloesser) that has been used by one of us (W. H.) during the last few years with considerable success, though the relief from the spasms may not last more than three to six months, is to inject the two main branches of the facial nerve where they cross the posterior border of the mandible in front of the ear. This can be easily and fairly quickly done, with practice, under local novocain only, with very little pain, and this method has the advantage that either or both of these branches can be injected at will.

If the spasms are limited to the region around the eye, with no clonic spasms of the angle of the mouth, the upper branch only should be injected, and frequently this is all that is necessary.

A fine hypodermic needle is used, and two Record syringes, one filled with 2 per cent. novocain solution, and the other with 90 per cent. alcohol (spir. vini. rect.). A horizontal mark is made with a dermatographic pencil on the skin at the back of the mandible to mark the level of the crossing of the facial nerve over the posterior border of the bone. This is done by pressing the left index-finger in front of the mastoid process and below the external auditory meatus, and then marking the level of the upper edge of the finger. Another vertical line should be drawn downwards to mark the posterior border of the mandible. The hypodermic needle attached to the novocain syringe is now inserted through the skin at the junction of the two lines, and pushed directly down to the posterior edge of the mandible, which should be felt by the needle point. This is then slipped backwards over the posterior edge and directed slightly upwards, and three or four drops of novocain solution injected, moving the needle slightly upwards and downwards.

Then keeping the needle still, the alcohol syringe is fitted on, and after half a minute four or five drops of alcohol injected, moving the needle as before slightly upwards and downwards while doing so, and very slightly deeper than the posterior edge of the bone. Almost at once it will be found that the eyelid cannot be closed against resistance, and increasing weakness of the frontalis and corrugator also develop, while the angle of the mouth remains unaffected. In those cases in which the spasms affect the lower facial muscles also, the needle should now be partially withdrawn and inserted down to the bone pointing slightly downwards, then slipped over the posterior edge, and the injection of novocain and alcohol made as before. At once the muscles moving the angle of the mouth and the orbicularis oris will commence to weaken, and the amount of paresis can be regulated by the amount of alcohol injected.

When both branches of the facial nerve are injected in this way, the resulting facial paresis may be partial or total according to the amount of alcohol injected. It is interesting to notice that in those cases in which clicking noises in the ear accompany the clonic facial spasms, these noises continue after the facial spasms have been completely arrested by the facial paralysis produced. This is because the nerve-supply to the stapedius muscle is on the proximal side of the alcohol injection, being given off within the middle ear. Yet within a day or two these clicking noises always disappear, probably owing to a reflex effect of the nerve paralysis upon the ganglionic nerve centres, inhibiting the efferent discharges from above.

Although the relief from the clonic facial spasms thus produced is immediate, it is unlikely to be permanent, as with the repair of the nerve-fibres the path for the efferent nervous discharges is re-established, and the clonic spasms reappear gradually in three to six months as a rule, though sometimes twelve months or even longer relief is obtained.

NERVE ANASTOMOSIS.

In order to obtain a permanent cure, the facial nerve must be divided, and its peripheral portion permanently separated from the irritable centre above. With that end in view, and in order to avoid permanent facial palsy, nerve anastomosis with the hypoglossal was decided on by one of us (W. H.). So far as we are aware, only two nerve anastomosis operations for facial spasm have previously been recorded. Kennedy in 1899 performed end-to-end anastomosis of the facial and spinal accessory nerves for facial spasm with fairly successful result, and in 1921 Gibson performed end-to-end facio-hypoglossal anastomosis for the same condition. Gibson gives a good résumé of previous work on facial nerve anastomosis, with records of several cases of his own, all but one done for facial paralysis.

In several no recovery was seen until from six to ten months had elapsed after the operation, though good voluntary and associated movements returned, and convincing photographs are shown, though it is probable that emotional use of the facial muscles was confined in all to the unaffected side. This is only to be expected when we consider that for the return of such emotional movements it would be necessary for the facial cortical centre to develop

new paths for the conduction of impulses to the hypoglossal nucleus, which appears most unlikely to happen, or else that the cortical centre for the tongue movements should develop an association link with the facial centre, that they should work in tandem, so to speak. This theory seems an attractive possibility, and its development may probably be encouraged by persistent and steady practising by the patient, in front of a mirror, of combinations of voluntary movements or emotional movements of the face with various tongue movements.

Our first case, Mrs. A. aged 50, was operated on by Mr. Blundell Bankart in February 1930, employing end-to-end suture, and partial motor recovery of the face has been present for the past eighteen months, with no return of the clonic spasms, from which she had suffered, on the right side, for seven years.

Her present condition shows, of course, hemiatrophy of the tongue, but she does not notice any disability from this. At rest, the face shows very little deformity, but there is so far no return of voluntary power in any of the facial muscles, apart from those associated with synchronous movements of the tongue. During talking, the eyelid is seen to close slightly, and the nasolabial fold to deepen, while if the tongue is pressed forwards against the teeth there is seen strong contraction of the zygomatici and of the orbicularis palpebrarum. Showing the teeth, smiling, pursing up the lips, or wrinkling the forehead show no return yet of voluntary power, and this is only to be expected, inasmuch as it must take much longer for conducting paths to become established between the facial cortical centres and the hypoglossal nucleus, than for impulses normally sent from the hypoglossal nucleus to the tongue muscles to reach the facial muscles through the anastomosis. Such movements should normally commence to appear as soon as the new hypoglossal fibres can grow down along the peripheral portion of the divided facial nerve, which appears to be three months, almost exactly.

She has been told to practise daily making facial movements in front of a mirror, and thus to aid the development of independent facial movements should the necessary intramedullary nervous paths of conduction to the hypoglossal nucleus begin to function.

During the past year four more cases have been operated on by one of us (A. D. W.), 10, 6, 5, and 3 months ago respectively, and of these the first case has been done long enough to report upon, while the second case began to develop associated movements of the eyelid and the angle of the mouth with the tongue at the end of three months. The third case (Fig. 1) has not after five months yet shown any power of contraction of the paralysed muscles, though tonus is returning as she notices her face is much straighter. Even if no further recovery should take place, she is quite pleased to have got rid of the constantly recurring facial spasms. There is plenty of time yet, however, for recovery to ensue, for several of Gibson's and other published cases show an interval as long as ten months before return of power was evident.

FIG. 1. FIG. 2.

FIG. 1.—Woman, aged 23. Left mastoid operation 11 years ago, immediately followed by complete left facial palsy. Six years later clonic facial spasm commenced at the angle of the mouth, gradually becoming violent. Left facio-hypoglossal anastomosis operation June 29th, 1931. The photograph shows the face at rest, a few days after the nerve anastomosis.

FIG. 2.—Patient is now attempting to smile and to close the eyes. No voluntary or associated movements on the paralysed side have yet appeared.

FIG. 3. FIG. 4.

FIG. 3.—Man, aged 51, showing face at rest 10 months after the nerve anastomosis operation.

FIG. 4.—Showing associated contraction of the eyelids and angle of the mouth on the operated side when he pushes his tongue forwards against his teeth.

Mr. B., aged 51, first noticed a twitching in the right lower eyelid in 1915. He could not trace the onset of this to any cause, but from the commencement the twitching has never left him entirely, and has gradually grown worse, until he had great difficulty in getting the eye open at times. He abandoned his trade of shoemaking because he was always being unsighted when the eye closed involuntarily. On testing the facial movements, there was definite slight paresis of all the facial movements on the right side, with overaction and contracture shown when making any strong movement such as closing the eyes forcibly. Spontaneous spasms at times were strong, closing the eye completely, and drawing the angle of the mouth strongly towards the right.

He was operated on, Feb. 23rd, 1931, the technique outlined below being followed. The post-operative course was normal, and he went home on the tenth day, wearing a Jennings splint, with instructions to massage and support his face. From that time until recently he attended the Aldershot Hospital for electrical treatment. At the time of writing many of the facial muscles show a return of movement when the tongue is pressed forwards (see Figs. 3 and 4), especially the orbicularis palpebrarum and the zygomatici, and during speech a slight flickering of the muscles around the eye and the angle of the mouth can be seen synchronous with the tongue movements. Voluntary movements of the facial muscles alone, without tongue movements, are still absent, but the improvement so far is hopeful, and he is very satisfied and pleased to have got rid of the spasms, even if no further voluntary movement should return.

The treatment by division of the nerve is sure to result in abolition of the spasm, but it is essential to endeavour to improve the facial deformity resulting, so that the patient will not consider it a doubtful bargain to have exchanged a facial twitch for a facial palsy, though as already explained, owing to the contracture existing, the facial palsy produced is scarcely noticeable at rest. The surgical problem is somewhat simpler than that of facial paralysis, because the paralysis is produced at the time the anastomosis is made. There is not a long intervening period of time during which the distal part of the nerve and the facial muscles have undergone degeneration.

OTHER METHODS.

The multiplicity of operations suggested for facial paralysis indicates that none is entirely satisfactory. Plastic operations by insertion of fascial or silk loops to correct the sagging of the lower lid, the ala nasi, and the corner of the mouth, are usually reserved for cases where nerve anastomosis is impossible or has been a failure.

Myoplasty is sometimes of value, using muscles with or without their nerve-supply, to correct the drooping of the corner of the mouth and lower eyelid. The temporal muscle, the masseter (Lexer), and sternomastoid (Gomoiu) have been used, and Jianu has suggested using the stylohyoid or the posterior belly of the digastric, because these muscles are innervated by the facial nerve, although they can hardly be regarded as muscles of facial expression. Division of the cervical sympathetic is very favoured by the school of surgery led by Leriche. They argue that the eye changes of Horner's syndrome neutralise the disfigurement of facial paralysis, and even assert that the facial muscles will move on the paralysed side if the cervical sympathetic is cut on that side. Bourguignon has gone so far as to say that the facial nerve sends a branch across the mid-line to the orbicularis palpebrarum, and this nerve produces contractions if the antagonistic sympathetic impulses are withdrawn. In this connexion it is interesting to note that Sicard, Robineau, and Haguenau have reported two cases of clonic spasm of the face treated by simultaneous division of the facial nerve and cervical sympathetic. It is also claimed that the diminution in lacrymal secretion following sympathectomy removes the "unshed tear" appearance which results from facial palsy.

VARIETIES OF ANASTOMOSIS.

Treatment of facial paralysis by anastomosis with adjoining nerves has found more favour in this country, and valuable pioneer work in this connexion was done by Ballance. The nerves suggested for anastomosis are: (1) the spinal accessory in whole or in part (Ballance, 1895); (2) the glossopharyngeal (Schäffer); (3) the hypoglossal in whole or in part (Koerte); (4) the descendens noni or cervicalis or both (Rawa); (5) the cervical sympathetic (Ballance); (6) anastomosis of the facial to the hypoglossal, combin d with anastomosis of the ansa hypoglossi to the distal end of the hypoglossal, to neutralise lingual atrophy (Brown).

Koerte was the first to perform facio-hypoglossal anastomosis for the treatment of chronic facial paralysis, and Ballance and many others have adopted this procedure, end-to-end anastomosis being found far more satisfactory in results than end-to-side anast mosis. Ballance (1909) also united the distal end of the cut hypoglossal to the central end of half of the spinal accessory nerve, which he split for this purpose, and he claimed that 20 months later the nutritional and functional recovery of the facial, lingual, and cervical muscles was complete, and that the movements of the face and tongue were dissociated. His photographs scarcely bear out that statement in its entirety at least, as his Fig. 4, in which the tongue is protruded, shows clearly the overaction of the zygomatici on the paralysed side, associated with the protrusion of the tongue, just as we have observed in our cases. Ballance says that in his case the movements due to emotional stimuli were symmetrical and perfect, but he quotes Bernhardt as stating that after operations for facio-hypoglossal anastomosis the associated movements recovered, and some voluntary power of the face, yet the normal symmetrical play of the facial muscles in the expression of emotions was not regained. Certainly our results are so far more comparable to the latter description than to that of Ballance.

It is too much to hope that the complicated and delicate movements of facial expression can ever be entirely reproduced by means of any other nerve, and one can only hope to restore tone and mobility to the face. The anastomosis giving the best results at present is that with the hypoglossal. This nerve is a very active one, so a good tone is given to the facial muscles, and also there is considerable animation in the face in speech, involving as it does movements of both tongue and lips. The hemiparalysis of the tongue is not found to be of much inconvenience either in mastication or in speaking.

THE OPERATION RECOMMENDED.

The operation is carried out as follows:—

The skin incision can be nicely placed as a rule along a crease of the skin, from the mastoid process to the neighbourhood of the cornu of the hyoid. In men, this incision can only with difficulty be distinguished from a fold in the neck after a few months time, and in women it does not constitute a serious disfigurement. It is well to find the facial nerve first of all, because it is the more difficult of the two. The posterior belly of the digastric muscle must be clearly defined and its nerve of supply if possible identified, because it is an excellent guide to the facial nerve from which it arises.

The facial nerve can then be dissected out from the fatty tissue lying deep to the parotid gland; Kelly's comb is an excellent instrument for this rather difficult dissection. It is most essential to carry the dissection as close to the stylomastoid foramen as possible before dividing the nerve, so as to give as great a length of nerve as possible to bring down to the hypoglossal. Halstead's manœuvre of sawing through and reflecting the mastoid process is sometimes of value in difficult cases, to facilitate the exposure of the facial nerve. The hypoglossal nerve is generally quite easily found hooking round the occipital artery. The dissection of this nerve is carried to the base of the tongue until a large branch is seen to be given off, then the nerve is divided just proximal to this branch.

The peripheral end of the facial nerve and the proximal end of the hypoglossal are brought together and held by a temporary catgut stitch which must be passed with an atraumatic needle and tied with the first turn only of a surgeons knot, the ends of the thread are not cut and serve to steady the nerve and maintain apposition while the stitches through the perineurium are passed. The stitches through the perineurium are of silk of such fineness as to be almost invisible. It is prepared by separating the constituent strands of the finest surgical silk. Bishop Harman's corneal loup is worn during this part of the operation to magnify the field. After a row of these fine sutures have been passed, uniting the perineural sheaths, the catgut holding stitch is divided and removed, and it will now be observed that the suture line is almost impossible to distinguish from the rest of the nerve. So much depends upon the perfection of this anastomosis that it should be done with the utmost care, and with no consideration of the time involved.

Having completed the anastomosis, half of the thickness of the digastric muscle is turned forward as a flap from the

mastoid process and passed over the nerve, and resutured in place, thus the line of anastomosis lies in the substance of this muscle. It is a well-known fact that muscle is the ideal bed for a regenerating nerve (Robert Jones), and the suture line of the nerve should never be left in fatty or fibrous tissue, as the resultant cicatrisation endangers the regeneration. The perfect closure of the perineurium prevents the wandering of the regenerating nerve fibrils, and also prevents inflammatory cells wandering between the cut ends of the nerve, and increasing the cicatrisation.

An absolutely dry wound is secured before closing the fascia with interrupted fine catgut stitches. The skin incision is carefully sutured with a Halsted's subcuticular stitch and a firm even pressure maintained over the operation field by means of a piece of sponge rubber, cut to fit in behind the angle of the jaw, and kept in place by a bandage. The attention to absolute hæmostasis and the prevention of post-operative collection of serum by firm pressure is of the first importance.

Various reasons for failure of nerve anastomosis have been suggested.

1. Trauma to the nerve ends. This must be prevented by dividing the nerve cleanly at right angles with a knife, because scissors crush before cutting, and by refraining from picking up the nerve with forceps. The best instrument to steady the nerve for the passing of the guide stitch is a Gillies' hook. Once the guide stitch is in position no further manipulation of the nerve is necessary.

2. The formation of a post-operative hæmatoma and collection of serum leading to excessive scar formation may be prevented by accurate hæmostasis and a pressure dressing.

3. Cicatrisation at the site of the anastomosis is reduced to a minimum if the suture line is buried in the muscle. The enclosure of the anastomosis in an excised segment of vein is not regarded as so satisfactory as the burying of the suture line in muscle.

FIG. 7.

Chain and hook splint, made by Hamblin, Wigmore-street.

4. The use of unsuitable suture material. The outcome of war-time experience in man, and experiments in animals (Sargent), seems to point to silk as the best suture material, and naturally the finer the material the less irritation is caused. Chromicised catgut is regarded as most unsuitable for nerve suture.

POST-OPERATIVE CARE.

The post-operative care is of some importance to ensure a successful outcome to the operation. The patient stays in bed no longer than he feels inclined, and is usually walking on the afternoon following the day of the operation. The wound is not dressed until the tenth day, when the subcuticular stitch is removed. At this time galvanic stimulation of the paralysed muscles is commenced, and is continued steadily until facial movements return. It is probably best for the patient to have his own battery, and to treat the muscles two or three times daily for ten minutes. Massage should also be employed by the patient's finger to pull up the lower lid, the ala nasi, the frontalis, and the corner of the mouth, by stroking movements.

FIG. 5. FIG. 6.

FIG. 5.—Woman, aged 41, showing the face at rest 24 hours after left facio-hypoglossal anastomosis, Nov. 28th, 1931.

FIG. 6.—Patient is wearing a Jennings splint. The scar of the operation in the neck is also shown.

When reading or writing, the elbow should be rested on the table, and the paralysed side of the face supported by the palm of the hand; this is moreover a position frequently adopted naturally. When sleeping, the patient should lie on the affected side to give support to the facial muscles.

A facial splint is of great value (Dennis); either Miss Jennings's splint of German silver wire (Fig. 6) or the chain splint made for one of us (W. H.) by Hamblin of Wigmore-street (Fig. 7). The splint prevents overstretching of the zygomaticus and the levator anguli oris, and also prevents the cheek from puffing out, due to the weak buccinator.

Careful attention to the operative and post-operative details will lead to a measure of success in practically all cases, with a very fair cosmetic result. Gibson, in 1921, and Brown, in 1926, published photographs of cases with very fair results following this operation performed for facial palsy.

In the case of clonic facial spasm, how much more certain must be the outlook for return of facial movement when we are dealing with the freshly sectioned facial nerve and facial muscles in perfect condition, and no previous scarring from inflammation in the mastoid region. We therefore feel that it is justifiable to embark upon the procedure of facio-hypoglossal anastomosis in cases which cannot be sufficiently relieved by alcohol injection, and in which the spasms constitute a great source of annoyance, and even disability to the patient.

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THE OCCURRENCE OF PITUITARY HORMONES IN THE URINE IN CONDITIONS UNASSOCIATED WITH PREGNANCY.*

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SINCE the introduction of the Aschheim-Zondek test for pregnancy, many observers have noted that the so-called pituitary hormones may occur in human urine in conditions other than those associated with pregnancy. Prolan A, in particular, has been shown to be present at the menopause, after castration, and in some cases of malignant disease. It might be supposed that such a possibility would affect the accuracy of the Aschheim-Zondek reaction as a test for the presence of living chorionic elements in the body. One must, however, bear in mind the fact that it is the presence of prolan B, and not prolan A, in the urine which gives a positive result—namely, corpora hæmorrhagica and luteinisation in the ovaries of immature mice.

During the past year 250 tests were made on the urines of 169 male and female patients; some of the latter were pregnant, others not; 77 positive and 136 negative reactions were obtained, while in 37 instances the mice died. A considerable number of these experiments were performed with urines from cases of malignant disease, or from women in whom bilateral oöphorectomy had been performed, yet only two errors were made in the diagnosis of the presence or absence of living chorionic elements in the patient concerned. In these two cases the experimental technique, rather than the test itself, was at fault. The percentage error was 0·94 of the tests in which a result was obtained.

There is now no doubt of the value of the test in pregnancy, and in this communication the occurrence of pituitary hormones apart from pregnancy will alone be considered.

Prolan B.

Zondek [1] claims to have obtained A.P.R. II.† and A.P.R. III. in mice injected with urine from two cases of carcinoma cervicis. Elsewhere he states [2] that prolan B may occasionally be found in the urine after a patient has had both ovaries removed. Fluhmann,[3] using the blood-sera of women at the menopause or after castration, sometimes obtained evidence of the presence of this hormone, while Allan and Dickens [4] reported an error in pregnancy diagnosis which arose because the urine from a patient at the menopause produced corpora hæmorrhagica in the test animals. Hannan [5] obtained a positive Aschheim-Zondek reaction in two cases of genital carcinoma, and Stewart [6] reported a similar finding in a case of hyperthyroidism. Recently Susman and Nuttall [7] have claimed that the urines of 14 out of 18 cases of malignant disease produced a positive reaction. If by this they mean that the urines investigated produced the effects of prolan B in the genitalia of mice, it was an unusual finding, for as Zondek's results show, the occurrence of this hormone is rare as compared with the occurrence of prolan A, in these circumstances.

In the face of such evidence, it is not possible to deny that prolan B can occasionally be found in the urine of non-pregnant women. Still in the tests on which this communication is based there has never been any evidence of the presence of the luteinising factor in the urine, except when the patient has had active chorionic elements in the body.

Prolan A.

In that part of the investigation which concerns prolan A, urines from patients at the menopause and after sub-total thyroidectomy were examined. In addition, urines from human beings and animals suffering with malignant disease, or in whom bilateral oöphorectomy had been performed, were tested. The urines, most of which were previously concentrated by a method described by Zondek,[3] were injected by a technique similar to that employed in the ordinary pregnancy diagnosis tests.

MENOPAUSE.

It is generally agreed that at the menopause there is a gradual cessation of ovarian activity, and an associated readjustment of the endocrine balance in the body. In the light of our present knowledge of the relationship between the pituitary and the ovary, it is difficult to be certain whether the diminished ovarian function is a primary or secondary feature of this process. Whatever be the mechanism of the disturbance, the fact that it occurs is evidenced by the excretion of prolan A in the urine. Zondek [8] reports the presence of the follicle-stimulating hormone in the urine of menopausal patients; he is of the opinion that it appears late in this physiological process. Fluhmann [3] found that at the onset of menopausal symptoms, 33 per cent. of all patients have demonstrable quantities of prolan A in the circulation. At a later stage in, or just past, the menopause, he showed that five out of seven patients had this hormone in the blood stream.

The urines of six women who were at, or about, the climacteric have been examined; of these, one killed the mice, three contained the hormone, and two did not. Those patients who excreted the hormone were at the commencement of the menopausal disturbance.

Zondek [8] in discussing the reason for the excretion of prolan A at the menopause says that it must be because the ovaries cannot utilise it, or because the functioning ovary normally inhibits the activity of the anterior lobe of the pituitary. He points out that since hypophyseal transplants will stimulate the senile ovary of a mouse or rat, the first view cannot be accepted, and the second must be the true explanation.

CASTRATION.

Fichera,[9] in 1905, first pointed out that hypertrophy of the pituitary follows removal of both ovaries. Blair Bell [10] confirmed this finding, and described microscopical changes which he regarded

* This investigation was undertaken on behalf of the Liverpool Medical Research Organisation.

† Anterior pituitary reaction.

as indicative of increased functional activity. Other observers have held that the changes are degenerative in nature, but Evans and Simpson [11] have found that bilateral gonadectomy, performed prior to removal of an animal's pituitary for transplantation experiments, increases the potency of such transplants, and Zondek [1] and Fluhmann [3 12] have demonstrated the presence of prolan A in the urine and blood-serum of patients, after bilateral oöphorectomy. These two facts seem to prove conclusively that the pituitary changes are not degenerative but hyperplastic.

Zondek states that after castration the follicle-ripening hormone can be found in the urine in quantities as large as 150 R.U. (rat units) per litre.

An attempt was made to verify these findings. The result was that, of four patients under the menopausal age who had bilateral oöphorectomy without an ovarian graft, two showed prolan A in the urine after operation. In one, the hormone appeared as early as the eleventh day after castration, but was not present later; in the other, it was not found until six weeks after removal of the ovaries. This small number of cases does not enable one to say at what times the hormone usually appears and disappears; but Fluhmann [3] obtained a positive result as early as the ninth day, and as late as fourteen years after the operation. He also found that the urines from some patients, which had been negative at first, became positive later. In one of my cases prolan A, although present at first, disappeared later; this seems to imply that its occurrence is merely a temporary effect of the general endocrine disturbance.

This variation in the time of the appearance of the hormone is in accordance with the findings of Rössle [13] who observed that the changes in the pituitary developed sometimes as early as five days after castration, while in others a considerable time elapsed before they were manifest.

This over-activity of the hypophysis, since it occurs both at the menopause and after castration, is probably due to the removal of ovarian stimulation. As to what ovarian factor is concerned there is some dispute. Kraul [14] quotes the investigations of other workers which appeared to show that injections of œstrin, after castration, prevented the changes in the anterior pituitary. However, Fluhmann and Kulchar [15] claim to have demonstrated that the appearance of what they call "castration" cells in the hypophysis, is not related to a diminished amount of œstrin. Fluhmann [3] found that the constant administration of the follicular hormone to castrated rats over a period of three months failed to prevent the the typical pituitary changes. But Mahnert and Siegmund [16] observed that injections of œstrin into a normal animal delays ovulation, and since the latter event is now believed to be dependent on the pituitary, it is probable that an excess of œstrin in the body diminishes the prolan A output, and vice versa.

On this assumption, it is possible to explain the periodic ripening of the normal Graafian follicle. When no follicle is ripe, and no œstrin is formed or is circulating in the blood stream, the hypophysis secretes the follicle-ripening hormone. This leads to the production of œstrin which inhibits the pituitary and prevents, for the time being, the secretion of prolan A.

In three further cases which I have studied, the patients were past the menopause before their ovaries were removed, and none of them had any prolan A in the urine—a finding in conformity with the above hypothesis. In three other cases of oöphorectomy the patients had an ovarian graft in the rectus abdominis muscle. One would expect that in these cases pituitary hormone would not have been found in the urine, yet it occurred in considerable quantities in two of the patients. However, inquiries into the operative details of these two cases revealed the fact that in both of them the ovaries were so diseased that only a very small portion was available for grafting. Although in one patient this was sufficient to promote the continuance of menstruation one can imagine that there would be a considerable reduction in the amount of œstrin produced, especially as an attempt was made by the operator to remove the follicle-bearing area from the transplanted ovarian tissue.

It is interesting to note that Fluhmann [3] found that whereas, after operative or radiation castration, at the menopause, and in some patients with prolonged periods of amenorrhœa, the follicle-stimulating hormone appeared in the blood stream, yet in women with scanty and infrequent irregular menstruation no hormone was found. This he attributes to the fact that in the latter conditions, the hypoöphorism is merely secondary to decreased activity of the hypophysis. Again he found prolan A in some cases of menorrhagia and severe dysmenorrhœa; this he explained by assuming that the underlying cause of such condition is increased activity of the anterior lobe of the pituitary.

In view of these findings, and in view of the fact that the urine of pregnant animals never gives a positive pregnancy test (prolan B), it is of interest to know whether prolan A is excreted in the urine of castrated animals or not. Kraul [14] found that the hypophyses of rabbits whose ovaries had been removed produced greater prolan A and prolan B effects when transplanted into immature rats than did those from animals not previously castrated.

In the present investigation the ovaries from six rabbits were removed and specimens of urine were subsequently collected in a metabolism cage and tested on immature mice. One of the rabbits died six days after operation, and so cannot be considered in the assessment of the results. Of the remaining five, it was found that two definitely, and a third doubtfully excreted prolan A in the urine. The hormone was present as early as nine days after operation, but in two of the animals it seemed to be only temporary. One of the rabbits had not reached puberty at the time of the operation and it is interesting to note that the pituitary hormone was found in the urine in this case.

The finding of this hypophyseal hormone (prolan A) in the urine of an animal is remarkable; it at least proves that the pituitary of a rabbit is capable of producing it in quantities sufficient to be demonstrable in the urine.

THYROIDECTOMY.

Schilder,[17] in 1911, first showed that histological changes occur in the pituitary in conditions of thyroid aplasia.

Blair Bell,[18] in 1913, described in detail the hypophyseal changes following thyroidectomy in cats, and concluded that "thyroidectomy causes an increase in the secretory activity of all parts of the pituitary body." However, Bryant,[19] although finding an increase in chromophobe cells in the pituitary of the rabbit after thyroidectomy, does not believe that the activity of this gland is increased. It should be noted that, as Blair Bell stated, the thyroid and pituitary of the cat more nearly resemble these organs in the human subject than do those of the rabbit, in which animal experimental changes are less well defined.

Smith [20] showed that ablation of the anterior pituitary leads to atrophy of the thyroid, and that this effect can be prevented by pituitary transplants. Later, Evans and

Simpson [21] went so far as to suggest that the anterior lobe of the hypophysis secretes a separate principle whose sole function is to stimulate thyroid activity. Crew and Wiesner [22] have lately produced more evidence in favour of the presence of a separate thyreotropic factor in the pituitary; this they call the "theta factor." Within the last few months Gant,[23] while working with the *Amblystoma jeffersonianum*, has found that heteroplastic anterior pituitary transplants result in an increased activity of the thyroid gland, and that secretion and discharge of the follicular colloid is stimulated. Silverberg [24] has also shown that injections of hypophyseal extracts stimulate the thyroid in guinea-pigs.

The bulk of evidence therefore points to a thyroid-pituitary relationship which is somewhat similar to that of the ovary and the pituitary. Accordingly it was decided to test whether there is any evidence of the excretion of pituitary hormones following removal or reduction of the influences of the thyroid secretion on the body. Total thyroidectomy cannot be performed in the human being, so patients were chosen who had had approximately five-sixths of the gland removed for exophthalmic goitre. This choice was made since it was felt that such patients, more than any others, would be subjected to an immediate reduction of the thryoid secretion in the body.

Out of the nine cases examined, in three definitely, and in two others doubtfully, a hormone whose action was similar to that of prolan A appeared in the urine following the removal of the greater part of an over-active thyroid. It was present as early as the seventh day, but in one case its occurrence was only temporary. Possibly if the whole gland had been removed, all patients, male and female, would have excreted the hormone. Nevertheless, in the consideration of these results, it must be borne in mind that such cases can hardly be comparable with those in which the thyroid is normal ab initio. It would, therefore, be interesting to perform total thyroidectomy on normal animals, especially cats, and to examine their urine subsequently. This was not done in the present inquiry.

Blair Bell [18] demonstrated increased activity of the thyroid following oöphorectomy; it may now be inferred that this effect is only secondary to the pituitary hyperplasia which follows castration. In the same way it is possible to explain the enlargement of the thyroid which sometimes occurs at puberty in patients with hypoöphorism. The increased thyroid activity during pregnancy may be the result of the large amounts of prolan A, or an associated "theta factor" in the circulation, or may be secondary to a diminished ovarian follicular activity at that time. This view is borne out by the work of Riddle [25] who showed that there is a regression in the thyroid of doves during periods of ovarian activity.

From this mass of evidence one arrives at a possible explanation as to why thyroid therapy has been found to be effective in ensuring the continuance of pregnancy to term in those women who have had a series of abortions and premature labours for no obvious reason. The ætiology of these conditions may be related to an increased prolan A, or œstrin, output. In either case, administration of thyroid should tend to inhibit the hypophyseal activity, and to diminish the secretion by it of the follicle-ripening hormone.

DISEASES OF THE ENDOCRINE GLANDS.

It is possible that pathological conditions of the thyroid, suprarenal, and pituitary might, on occasion, result in the appearance of the hypophyseal hormone in the urine. From what has been said, one might expect that in hypothyroidism prolan A would be excreted; no case of this disease was examined. Three patients with exophthalmic goitre gave negative results prior to operation. A case of diabetes insipidus associated with a posterior pituitary tumour likewise had no demonstrable amount of the anterior lobe hormone in the urine. This result, however, is of very little significance since the urine had such a low specific gravity. No prolan A was found in a case of Addison's disease. Lutein cysts of the ovaries have been reported in association with anterior pituitary tumours (Kraul [14]); these may have been due to an excess of prolan B in the circulation. Other observers have found prolan A in acromegaly; in this investigation the urine and blood-serum of one male acromegalic were tested and gave negative results.

NEOPLASMS.

Benign Neoplasms.—Zondek [1] claims to have demonstrated prolan A in the urine of patients with innocent growths. He found that 30 per cent. of patients who had fibromyomata uteri excreted the hormone, but in no cases of innocent ovarian tumours did he obtain a positive result. I have investigated six patients with fibromyomata uteri and in none was there any evidence of prolan A in the urine. Three cases of ovarian cyst (one dermoid, two cystadenomata) also gave negative results.

Malignant Neoplasms.—Zondek [1] found that in about 80 per cent. of female patients with genital carcinoma prolan A was excreted in the urine. It occurred in amounts as great as 200 R.U. per litre. In cases of extragenital carcinoma, the percentage of positive results was only 36. He also maintains that the presence of the hormone had no relation to the age of the patient, and was not associated with the menopause. Moreover, it was not related to the type of tumour.

In the present investigation the hormonic content of the urine of male and female patients suffering from malignant neoplasms in various parts of the body were investigated. It was found that such urines are exceptionally toxic to the mice. The clinical diagnosis was always confirmed at operation or post mortem.

Of three cases of genital carcinoma in males in which a result was obtained, one definitely had prolan A in the urine, and another probably had small amounts. It would be of interest to investigate a case of so-called chorion-epithelioma of the testis, but no such case has come under notice since this investigation was begun. A result was obtained in ten cases of extragenital carcinoma in males and in none was there any evidence of the pituitary hormone.

Zondek found that 13 per cent. of male patients with malignant disease gave a positive test for prolan A. Taking both of my series together, two out of thirteen patients excreted the hormone in the urine—that is, 15·4 per cent.

Zondek demonstrated prolan A in the urine in almost all cases of genital carcinoma in females. He said that the urines from:

82·5 75·0 75·0 100·0	per cent. cases of	carcinoma cervicis carcinoma corpus uteri ovarian carcinoma epithelioma vulvæ	gave positive results.

In the present investigation, 24 tests were made on the urines of 17 patients. In seven of these tests the mice died. The results summarised show that in:

Carcinoma cervicis	.. ..	16·6	per cent.	excreted prolan A.
„ corpus uteri	..	66·6	„	„ „
„ vaginæ	.. ..	75·0	„	„ „
„ vulvæ	.. ..	50·0	„	„ „

Of the female patients suffering from extragenital carcinoma and sarcoma, only one out of seven

examined—that is, 14 per cent.—had prolan A in the urine.

A final series of tests were made on rabbits inoculated with the Brown-Pearce tumour. The growth was extensive in each animal whose urine was examined. Altogether, the urines from eight rabbits, the serum from a ninth, and ascitic fluid from a tenth, were tested. In every case a negative result in regard to the presence of prolan A was obtained.

It would seem, therefore, that it is rare to find prolan A in urines of patients suffering with extra-genital carcinoma; only once was it demonstrable in such conditions. On the other hand, its occurrence is common when the malignant disease has its site in the genitalia.

Difficulty is encountered in attempting to explain why malignant tissue should be associated with the excretion of prolan A. It may be:—

1. *That the growth actually manufactures the hormone.*—It is well known that extracts of the human placenta produce in immature mice ovarian responses identical with those which result from the injection of the urine of pregnant women. Moreover, many authorities, including Philipp,[26] Collip,[27] and Bourg [28] are of the opinion that it is the placenta, and not the pituitary, which is the site of origin of the hormones excreted in the urine during pregnancy. If this is true, and since, as Blair Bell [29] has suggested, the behaviour of malignant tissue resembles that of the chorion, then it is reasonable to suppose that the growth may actually produce the hormone. In such circumstances, the individual variation in tumours such as the presence, or absence, of necrosis, or of encapsulation, would explain why the finding of prolan A in the urine is not a constant feature of neoplastic conditions generally. However, even such variations in the tumour do not appear to be sufficient to explain the remarkable fact that the hormone is but rarely found except when the neoplasm is situated in the genitalia. Moreover, in acetone and alcohol extracts which have been made from both human and animal tumours, no hormone has yet been demonstrated.

2. *That the growth may stimulate the pituitary to increased activity.*—In favour of this view, Zondek [1] states that many investigators have found "pregnancy changes" in the hypophyses of patients suffering from malignant neoplasms. More recently, Susman [7] has found histological evidence of increased activity of the anterior lobe of patients dying from these conditions. Berblinger [30] showed that injection of any protein caused pituitary changes, and he considered that in the case of neoplasms the products of tissue necrosis could produce this effect. However, this theory does not account for the fact that in the cases investigated in this series, only *genital* carcinoma caused the excretion of prolan A.

3. *That the increased activity of the anterior pituitary is the cause, and not the result of malignant growths.*—With regard to folliculomata of the ovaries, Blair Bell and Datnow [31] have already suggested that prolan A may be a factor in their ætiology in view of the multiple nature of the primary growths; but regret that they have not had an opportunity of making biological tests in any case of this type. Susman [7] has recently described a treatment for cancer which is based on the theory that the disordered overgrowth of tissues, which occurs in neoplastic conditions, is associated with an increased activity of the anterior lobe, and a decreased activity of the posterior lobe of the hypophysis. However, there is evidence to show that the excretion of prolan A in these cases is the result, and not the cause, of tumour formation. In the two cases of carcinoma corpus uteri which gave positive results, the hormone disappeared from the urine within ten days of hysterectomy. Also, Zondek [1] found that not only did the pituitary hormone vanish from the urine after the removal of the growth, but that it reappeared in the presence of a recurrence.

4. *That the presence of the growth in the genitalia gives rise to impulses which pass from the genitalia to the pituitary.*—It is well known that in the rabbit ovulation occurs about eight hours after coitus. Ovulation is now believed to be dependent on the pituitary, and Fee and Parkes [32] have shown that hypophysectomy, performed immediately after copulation, inhibits the rupture of the follicle in rabbits. It seems, therefore, permissible to assume that the vulva, vagina, and uterus are connected with the pituitary by a hormonal or nervous mechanism. Kraul [14] points out that mechanical irritation of the cervix in animals, or curettage in women, has been shown to produce changes in the ovaries. He states, moreover, that these changes occur even if the ovarian tissue is only present as a graft, and is situated at a distance from the pelvis. From this he infers that the ovarian changes are brought about by the anterior pituitary which is stimulated by impulses, probably nervous in nature, arising in the genitalia. If this be true, it is conceivable that the presence of a growth in the vulva, vagina, or uterus, may act as a local irritant and set up a train of impulses which pass to the pituitary and stimulate it to produce an excess of prolan A. This view will at least explain why prolan A is, for the most part, excreted when the genital tract is the site of the neoplasm. Moreover, the fact that prolan A disappears from the urine after removal of the growth is not incompatible with this theory.

Summary.

1. Experimental results are given confirming the work of other observers who have stated that prolan A can be found in the urine at the menopause after castration, and in some cases of malignant disease.

2. In this series of cases prolan B has never been excreted in the urine except when the patient had living chorionic elements present in the body. In other words, a positive Aschheim-Zondek reaction has never been obtained except in the presence of such elements.

3. It has been shown that prolan A can be detected in the urine of rabbits after castration.

4. Prolan A has also been found in the urine of patients who have had sub-total thyroidectomy performed for exophthalmic goitre.

5. The finding of prolan A in the urine of patients with malignant disease has been almost entirely confined to those cases in which the genital tract was the site of the tumour.

I am indebted to Prof. W. Blair Bell in whose department, and under whose direction, this work has been carried out. My thanks are also due to Dr. M. Datnow for his helpful advice and criticism.

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OPERATION UNDER LOCAL ANÆSTHESIA:

PREPARATION AND CARE OF THE PATIENT.

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DURING the past 75 years the progress of surgery has been intimately connected with the more or less thorough exploitation of the use of general anæsthetics. As actual preventives of pain, no drugs have, as yet, been discovered which can surpass them in this particular field. And yet their effect on pathological conditions of certain vital organs of the body, such as the heart in myocarditis, the lungs in caseous tuberculosis, and the kidneys in the various forms of nephritis prevent their use in countless numbers of people.

In order to eliminate diseased conditions where a general anæsthetic is to be employed, it is necessary to perform certain examinations and tests on the patient. Usually the first approach is the general physical examination of all the systems of the body, with particular emphasis on the condition of the heart and the blood pressure, and a thorough inspection of the lungs. Where the general survey of the patient leaves any doubt as to the functional ability of any of the main organs, the careful surgeon will demand, on certain of his cases, electrocardiograms, basal metabolic determinations, chest radiograms, or kidney function tests. Even urine cultures are frequently demanded. Urea-concentration tests are desirable also, for it has recently been shown by Haines and Milliken[1] (also F. Stephen[2] and J. Minnit[3]) that in prolonged ether-anæsthesia the excretion of the anæsthetic by the kidney actually causes a tubular degeneration, with partial disintegration of the epithelial cells and consequent post-operative rise of blood chemistry values. Hæmoglobin valuations, erythrocyte counts, and blood groupings are regarded as more or less routine measures in all the severer operations.

Abel[4,5] has recently advocated as immediate pre-operative requisites the following measures: at least two days' complete rest in bed; glucose given as barley sugar or orange juice, to keep up carbohydrate metabolism in order to fight off tissue insult; a sedative hyoscine possibly to be preferred the night before operation to ensure good sleep; blood transfusion if the hæmoglobin determination be below 50 per cent., or if the erythrocyte count be lower than 4,000,000 per c.mm.; glucose and insulin pre-operatively in cases of diabetes; and in the hæmorrhagic states, such as icterus or hæmophilia, 10 c.cm. of 10 per cent. calcium chloride intravenously combined with 15 units of parathyroid extract.

Lambret,[6,7] before the French Surgeons' Congress in October, 1930, recommended a simple diet before operation consisting of plenty of fruit and vegetables, very little meat, and no alcohol; thorough evacuation of the intestines should be accomplished by means of enemata, but aperients should be discouraged; if the urea content of the blood be over 0·5 g. operation is to be avoided, while in decompensated cardiac cases only urgent operations should be permitted; in chronic alcoholism alcohol and opium are given before operation to prevent delirium.

Neumann (Brussels) requires that his patients rest in bed before operation, and he gives them plenty of fruit juices, and infusions of physiological saline; for the last five days before operation, only a milk diet is permitted. De Fourmestraux emphasises the importance of oral and dental treatment which, if neglected, might lead to pneumonia. Pauchet prepares obese patients for operation by ordering complete rest in bed for a week, and giving them only a fruit and lemonade diet. Rowntree[4] even goes so far as to advocate a special pre-operative ward, to contain beds in charge of a physician well acquainted with surgical risks.

The trouble and expense involved in all these procedures appear essential in the preparation of cases for general anæsthesia. However, by introducing local anæsthesia into the field of major surgery, a large number of the surgeons of Continental Europe have, in one move, almost entirely eliminated these procedures. In the hands of English-speaking surgeons, the potentialities of local anæsthesia have never been thoroughly exploited. We may arrive at some idea of the economy of both labour and expense by a perusal of the experience of Prof. Finsterer of Vienna in his work with local anæsthesia during the past 20 years.

A TYPICAL OPERATION UNDER LOCAL ANÆSTHESIA.

If we choose as a typical major abdominal operation that of gastric resection[8] for duodenal or gastric ulcer, we may better visualise the procedure involved in caring for the patient. This operation requires from 1½ to 2½ hours, and in suitable cases is done entirely under local anæsthesia.

Before operation.—No condition of the heart, kidneys, or lungs contra-indicates operation. Hence accessory aids to diagnosis, such as electrocardiograms, chest radiograms, blood chemistry valuations, and kidney function tests, are all eliminated. Once the diagnosis of duodenal or gastric ulcer has been decided upon,* and operation deemed essential, other details of physical examination of systems outside the gastro-intestinal tract are of secondary importance. Only obvious factors which would contra-indicate major operation under general anæsthesia are taken into consideration. Examples are: extremes of anæmia, obvious by the pallor, where the hæmoglobin determination is below 25 per cent. or where the erythrocyte count falls below 2,000,000 per c.mm. In such cases it is found that the patient shows better recuperative powers if treatment be given after operation. It is usual, therefore, to transfuse such patients with 500 c.cm. of blood immediately post-operatively. Jaundice and cases of known blood dyscrasia are usually treated before operation. Icterus subjects receive one-third of an erythema dose of X rays over the spleen within four hours before operation. Beyond this time, e.g., in one case of Prof. Finsterer's where X rays had been given 20 hours before operation, there is extremely little bleeding to be seen during operation from cut vessels, with obvious difficulty in ligating; the danger of post-operative hæmorrhage in such cases is, of course, great. In addition, such cases of jaundice receive calcium chloride or horse serum intravenously before operation. When post-operative bleeding is suspected, these patients receive blood transfusions.

It is usual to ask the patient to arrive at the hospital the night before operation. No period of rest or building-up is required; nor is glucose deemed necessary to fight off the effects of tissue damage. An aperient of magnesium sulphate or castor oil is

* The usual methods in arriving at this diagnosis are, of course, employed, i.e., history, physical examination, gastric analysis, fluoroscopy and X ray, stool analysis, &c.

given. Before retiring for the night, such patients as have a history of nervousness or insomnia usually receive luminal or veronal by mouth, to ensure a good night's rest. Cases of diabetes are given insulin just before operation, but even this may be omitted if the case be mild. If chronic pyloric obstruction with cachexia be present, or hypotonia, an injection of pituitary extract just before operation is indicated.

A routine measure in all major operations is the use of morphine or its derivatives. Prof. Finsterer employs omnopon, 0·02 g. one hour before operation, and immediately before 0·015 to 0·02 g. of morphia with 0·0005 g. of atropine. The main purpose of these drugs is to allay apprehension on the part of the patient rather than to utilise their anodynic powers.

During operation.—It is usual to begin the operation by block anæsthesia of the anterior abdominal wall[9] with 0·5 per cent. novocain-adrenalin solution. This is injected through the skin and into the subcutaneous tissues below the proposed site of incision and directly into the recti abdominis. To ensure proper relaxation, 60 to 80 c.cm. of the anæsthetic are used, mostly put into the substance of the muscle. This is carried through to the peritoneum. When the peritoneum has been incised, it is held up by sharp retractors and infiltrated from the inside with 10 to 15 c.cm. of the anæsthetic, on either side of the incision. If this be injected away from the mid-line, it will permit of subsequent painless pulling on retractors, to disclose the field of operation.

The index-finger of the left hand is now introduced immediately below the liver and downwards between the viscera, to the region of the twelfth thoracic vertebra. Here the pulsating aorta is readily felt, and the finger is next pushed slightly upwards until the pulsating hepatic artery is encountered. By firm pressure with the finger-tip, the aorta and vena cava are then pushed apart and a fine needle, 20 cm. long, is guided, above the finger, right down against the bone. Slowly, with repeated aspirations to be sure the needle point is not in a vein, about 50 to 70 c.cm. of the 0·5 per cent. solution are now injected. This is the method of Braun.[9] If blood be aspirated, even in the slightest amount, the needle is immediately withdrawn and mesenteric (root) anæsthesia substituted. The reason for this is that the fluid may be forced through even minute openings in the veins, the result being rapid intoxication. In anæmic and cachectic individuals, only 50 c.cm. of 0·25 per cent. solution are used.

The anæsthetic is usually effective in ten minutes, and lasts from three-quarters of an hour to two hours. In gastric resections the preparation of the duodenum and pancreas is usually completed in one hour, and after that any pain experienced is usually not intense. Nausea and vomiting due to peritoneal irritation, to too rapid absorption of the anæsthetic or, possibly, to the morphia previously given, may occur, but are usually overcome by simply lowering the head. If this be insufficient a hypodermic of caffeine sodium benzoate is generally adequate.

In a publication in 1926 Prof. Finsterer [10] reported 807 cases of major abdominal operation under local anæsthesia as performed by Braun's method. In this series, ether was used only 71 times (8·8 per cent. of cases). Of 468 resections of the stomach reported up to this time, ether was used 33 times (7 per cent. of cases). Those requiring ether received varying amounts of the anæsthetic up to 50 c.cm.

Sometimes ether is essential, as in nervous children, or cases of diffuse peritonitis following perforation of a viscus, where the peritoneum must be swabbed and the mesentery mopped up. Some severe operations, lasting up to five hours, will frequently require ether in the terminal stages, as the effect of the local anæsthetic is not lasting.

AFTER-TREATMENT.

Immediately after operation the patient is put in a partial Trendelenburg position,[11] with the knees elevated in order to prevent thrombosis of the leg veins, dangerous on account of lung embolism. The shoulders are raised so that the patient assumes a partial sitting position, in order to prevent lung congestion.

Where there is cause to fear the onset of post-operative lung conditions, as in overworked labourers or aged individuals with extensive emphysema, it is usual to give transpulmin, a quinine derivative, twice daily, to prevent pneumonia. All patients over 60 receive injections of 2 c.cm. of camphorated oil every two hours for three days to aid expectoration. So many aged individuals have a purulent bronchitis with impaired ability to bring up foul sputum that it has proved decidedly advantageous to take particular care of them after operation. Although all patients receive one injection of pantopon the first night after operation (unless contra-indicated through old age or severe anæmia), the injection is not repeated. It is felt that drugs of this nature tend to inhibit the cough reflex, and in this way to encourage retention of lung secretions. The older patients are encouraged to breathe deeply at all times, and to cough occasionally. When they cough an attendant should support the recti abdominis so that no pain is experienced, and damage to fresh sutures is minimised.

Nausea and vomiting within the first 24 hours after operation are usually due to previously administered morphine or to foul blood in the stomach. The latter should be removed by gastric lavage. Where post-operative hæmatemesis occurs the stomach is immediately washed out with iced water and the manœuvre repeated until the return flow is clear. If at the end of several washings blood is still present, it is best to wash with 100 c.cm. of a 1 in 1000 solution of silver nitrate, a procedure which may be repeated once.

There have been no deaths from operative shock, and no deaths from heart failure, although many of the cases were considered hopeless by other surgeons and were refused operation by them. This fact is attributed to exclusion of deep general narcosis and to efficient after-treatment. It has been observed, in the vast majority of cases, that the general condition of the patient is better and that meteorism and nausea and vomiting are much less than after the use of general anæsthesia.

Only three cases of acute dilatation of the stomach have been met with by Prof. Finsterer in all his cases done under local anæsthesia (over 3600 laparotomies), and these were attributed to chilling of the organs, due to the fact that the operations were performed in cold rooms (war period). They rapidly recovered on stomach lavage.

For post-operative pains from excessive gas-formation, it is usual to give hot air treatment over the abdomen by an arc of electric lights. Pantopon serves only to increase the constipation. The rare cases of severe intestinal atony encountered after the use of local anæsthesia have never proved fatal. They are treated by enemata on the second day, when gas and a small amount of fæces usually pass, and thereafter no treatment is required. In contrast to this are 600 cases done under general anæsthesia by Prof.

Finsterer where two proved deaths from atony of the gut were observed, and three probable fatalities. In cases of chronic constipation or morphine addiction, where drugs are required post-operatively, meteorism is combated by warm air applied to the abdomen, washing out of intestines with warm water at 40° C. and injections of pituitary extract two or three times daily.

It is believed that these post-operative precautions avoid complications. In 1312 cases of gastric resection for gastric or duodenal ulcer (up to 1930) there have been only three deaths from pneumonia and two cases of pulmonary embolism.

Apart from these measures against specific disorders, general principles are followed, which aim at the general building-up of the body resistance. For the first 24 hours the patients receive only fluid, in the form of a Murphy drip, either saline or 5 per cent. glucose. In the next 24 hours they have a tablespoonful of alkaline mineral water, or cold tea by the mouth every hour. If there be no vomiting after 48 hours, they receive tea with small amounts of milk, in gradually increasing doses. After the fourth day the diet becomes semi-liquid, consisting of gruels, purées, mashed potatoes, thin cream of wheat, honey, and tea with milk. At the end of about the second week, finely ground-up meat is added. The post-operative diet in cases of duodenal ulcer is very strict, as there usually remains a chronic gastritis which must be given time to heal.

RESULTS.

The results obtained in the employment of the measures outlined above in the hands of proficient English-speaking [12] surgeons should coincide closely with those of surgeons of continental Europe. Certainly the statistics of Prof. Finsterer in his large series of cases appear amply to justify the routine adoption of local anæsthesia in all major abdominal surgery.

Follow-up statistics of resection for gastric ulcer [13] from 1911 to 1923 show 105 cases, with complete cure in 98 per cent. There were no dietary limitations, all gained in weight, and all were able to do hard work. Two of the cases complained of heartburn and eructations when they ate certain foods. Of 236 resections for duodenal ulcer performed from 1916 to 1923, 94 per cent. have been cured. Only one case of proved jejunal ulcer was demonstrated after gastric resection, and this was cured by reoperation with a more extensive removal of the stomach remnant. It is believed that good end-results ensue only when a large part of the stomach has been removed and retrograde filling prevented by attaching the afferent loop high up on the lesser curvature.

One criticism of this operation (von Haberer) is that full meals cannot be taken because such small stomach remnants are left. Symptoms in such cases are palpitation, dyspnœa, fullness and nausea. This may occur in the first few weeks following the operation, but if the patient lies down for ten minutes after each meal, such symptoms rapidly disappear. After two to three months the jejunal loop shows immense compensatory enlargement, so that after that time full-sized meals may be taken without discomfort. It must be emphasised that moderation in diet is essential for two or three months, but after that the patient may eat any food. Opposite to this is Moynihan's advice after gastroenterostomy, where he advocates careful dieting at all times.

Arthur Hurst [14] indicates the danger of diarrhœa following resection of the stomach. The probable cause would be inability of the acid barrier of the stomach to cope with pathogenic micro-organisms from the mouth, so that enteritis or colitis may arise. Up to the present time Prof. Finsterer has had only two cases of diarrhœa following all his resections, and the condition was present only when the patient ate certain foods. As to whether or not micro-organisms may readily pass through such a stomach where so little acid is present, later to penetrate bile-ducts, pancreatic ducts, or invade the gut wall to serve as foci of chronic infection—there is no evidence to show any greater incidence of long-standing sepsis among those with stomach resection than among ordinary individuals.

Only one, doubtful, case of pernicious anæmia following resection has been seen in Prof. Finsterer's cases. Here the internists said the blood picture and the symptoms were not those of true pernicious anæmia, while the pathologist claimed that the bone-marrow picture was typical of Addisonian anæmia.

The efficacy of splanchnic anæsthesia to inhibit pain in major abdominal surgery appears to be well established. The writer has observed many cases fall into a peaceful slumber during the course of the operation. From a purely mercenary point of view, it appears essential for the larger hospitals to dispense with the use of general anæsthesia whenever possible and to substitute local anæsthesia. Finally, when one sees patients who have had the stomach resected the previous day sitting up in bed reading, or asking why they are not permitted real meals to appease their hunger, one wonders if local anæsthesia should not be more universally employed from a purely humanitarian point of view.

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Clinical and Laboratory Notes

A CASE OF CEREBRO-SPINAL FEVER.

RECOVERY AFTER SEVENTY-EIGHT LUMBAR PUNCTURES.

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ONE of the difficulties occasionally experienced in treating cases of cerebro-spinal fever is the continued increased secretion of cerebro-spinal fluid, which may go on during convalescence. Foster and Gaskell [1] have described a case in which the illness ran a prolonged course of over two months, 32 punctures in all being performed; the condition in this case, clinically, was such as to give rise to the fear of hydrocephalus and on this hypothesis lumbar puncture was vigorously persevered with and the patient recovered completely. The importance of repeated lumbar puncture is well recognised. It was emphasised in 1905 by Lenhartz, [2] who pointed out the desirability of measuring the pressure of the fluid, and of not removing more than 50 c.cm. at one puncture. Neale [3] has also commented on the importance of lumbar puncture for the relief of pressure during convalescence and in three of her cases 20, 10, and 17 lumbar punctures were carried out. Krasnogurski [4] has treated cases of suppurative meningitis with increased pressure and compression phenomena by temporary spinal drainage by means of a thin silver tube.

The amount of fluid which should be withdrawn is generally regarded as being the maximum that can be obtained. There is little doubt that this is the correct procedure in the acute stage of the disease. As Krasnogurski pointed out, the decrease of the pressure in the ventricular system is the natural incentive to the flow of cerebro-spinal fluid and this is of great value in treatment, since the child absorbs a good deal of cerebro-spinal fluid. When, however, the acute stage of the disease is over and the patient is still secreting an abnormal quantity of cerebro-spinal fluid, the question arises whether the withdrawal of the maximum quantity of fluid is the best method of treatment as possibly a greater stimulus to further secretion might be given than is desirable. This possibility was borne in mind in the treatment of the following case.

Of four cases of cerebro-spinal meningitis admitted last year to the Ilford Isolation Hospital three recovered. The first three were all of the toxic variety with purpuric rashes and were all due to type I. meningococcus. The first of these was treated with an antimeningococcal serum probably deficient in anti-endotoxic action, for it had no specific effect and the patient died. The next two cases were treated with another brand of serum which had an immediate and specific effect; both patients recovered with great rapidity.

The fourth case, a boy aged 8 years, was admitted to hospital with a history of influenza for 14 days with vomiting, headache and cough, pains in the limbs, and nasal discharge two days before admission. When admitted he was conscious, with flushed cheeks, marked head retraction, Kernig's sign + both sides, retracted abdomen, T. 101·4°, P. 84, R. 22. Lumbar puncture was performed and 25 c.cm. of turbid fluid were withdrawn. The report on the fluid showed no sugar, albumin +, pus cells, and meningococci inagglutinable to type sera I., II., III., and IV. Five c.cm. of antimeningococcal serum were given intramuscularly in desensitising doses commencing with 0·1 c.cm.; finally 15 c.cm. of antimeningococcal serum were given intrathecally.

During the next ten days lumbar puncture was performed daily and a total of 120 c.cm. of antimeningococcal serum was given intrathecally and 55 c.cm. intramuscularly. After the first punctures a general anæsthetic was given not only with a view to the comfort of the patient, but as pointed out by Flack [5] the amount of fluid can be increased by this means.

At the end of this period the fluid still showed many polymorphonuclear cells with many intracellular meningococci. It would appear that the serum had little if any specific action in this case. The temperature from admission to March 10th was remittent in character; from March 11th to the 15th it was intermittent. It remained subnormal from March 23rd to April 3rd. The fluid on March 24th was clear and sugar was present in it on March 27th. On March 31st 10 c.cm. of clear fluid only were removed, apparently not under pressure.

Lumbar puncture, which had been continued daily, was discontinued for the first three days in April. This was followed by a relapse; the temperature rose to 103°; the patient had headache and vomited. The lumbar puncture which was performed showed fluid under pressure and 35 c.cm. of clear fluid were removed. Lumbar puncture was continued daily; the temperature fell, it remained a little unsettled for two days. On April 10th he had another relapse; he vomited and his temperature was raised to 103° and remained above normal for three days. The cerebro-spinal fluid was still under pressure. It was decided to estimate the pressure of the cerebro-spinal fluid by a Greenfield's manometer and only to remove a sufficient quantity of fluid to reduce it to normal.

The estimations were commenced on April 29th. On this day the pressure was 300 mm. The process was repeated daily for 21 days. On May 1st the fluid showed no polymorphonuclear cells, no meningococci, protein slight trace, globulin absent, sugar normal.

The boy's condition slowly returned to normal. The pressure of the fluid remained high, but on May 29th the withdrawal of 18 c.cm. of fluid was sufficient to reduce it to normal. Lumbar puncture was discontinued on this date. On June 9th his temperature rose again and as the Kernig was still +, lumbar puncture was done. Only 10 c.cm. of normal clear fluid not under pressure were removed; the fluid showed no meningococci and no excess of protein. The cause of the rise in temperature was a myalgia.

From this date onwards no further lumbar punctures were performed and the boy made an uninterrupted recovery and was discharged on June 27th after a period of over 17 weeks in hospital, 78 lumbar punctures having been performed, and a total of 2601 c.cm. of cerebro-spinal fluid having been removed. After a period at a convalescent home he returned to school and is normal in health both physically and mentally.

The interesting points in the case are: (1) the length of time during which the cerebro-spinal fluid was secreted in excess amount, two "relapses" occurring; (2) the large number of lumbar punctures required (78) to effect a cure; (3) the importance of this treatment in view of the aberrant form of meningococcus found, the poor specificity of the serum as well as the continued high pressure of the cerebro-spinal fluid; (4) the attempt made to lessen the effect of over-stimulation of the secretion of cerebro-spinal fluid by measuring the pressure and withdrawing sufficient only, when the fluid became clear, to bring the pressure to normal.

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A CASE OF ACUTE ANÆMIA DURING PREGNANCY.

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WE think this remarkable case is worthy of record as an example of a rare form of pregnancy toxæmia which has very seldom been reported in England.

The patient, a well-nourished woman of 25, was first seen in private practice on Nov. 9th, 1931. She had had one child, born uneventfully sixteen months before, and she was now pregnant again, about seven months according to her own calculations. She had not felt well since the onset of the pregnancy and she complained of a "cold and cough."

She looked very ill. The temperature was normal and the pulse-rate 110. There was marked anæmia, as shown by the extreme pallor of the lips and conjunctivæ, and there was extensive œdema involving the face, upper and lower extremities, and, to a lesser degree, the abdomen and back. A systolic murmur was audible over the præcordium but the lungs appeared normal. The throat was much injected and this undoubtedly was responsible for her cough. She was a heavy smoker. The duration of pregnancy, as judged by the height of the fundus uteri above the symphysis pubis, was little more than six months. Fœtal parts could be felt and the fœtal heart was heard. The urine was clear and the specific gravity was 1025. Apart from a slight trace of albumin there was no other abnormal constituent present.

Eliminative treatment was instituted and the patient put on a fluid diet. Definite improvement followed and by the fourth day there was marked diminution in the œdema but the pallor remained. On the fifth day she became suddenly worse, with pain in the back and legs, and great breathlessness. She was immediately sent to the Middlesex Hospital.

She was admitted at 8.40 P.M. on Nov. 15th, and seen by Mr. Frederick Roques. She was profoundly anæmic and the pupils were widely dilated and reactive to light. The pulse was running in character and individual beats could not be felt. The temperature was 96·5° and the respiration was rapid, about 50 to the minute. Air-hunger

was marked and she was very restless. The heart was enlarged and the heart sounds clear but weak; adventitious sounds were not heard. The blood pressure was 120 mm. Hg. Moist râles could be heard all over both lungs. The abdomen was soft and the liver and spleen could not be felt. She did not complain of any abdominal pain or tenderness. The fundus uteri was at the level of the umbilicus and fœtal parts were readily felt but the fœtal heart could not be heard. The cervix was dilated to two fingers and there was no external hæmorrhage. There was a slight trace of albumin in the urine.

The patient thus presented an almost typical picture of a severe internal hæmorrhage, save for the absence of abdominal signs and she was taken to the theatre, but died before the abdomen could be opened.

A post-mortem examination was performed by Sir Bernard Spilsbury and the findings were as follows:—

The heart was dilated and showed extensive fatty degeneration of its muscle. The lungs were very œdematous and the liver and spleen were only slightly enlarged. Histological examination of the liver showed the presence of free iron and some fatty degeneration of the liver cells. The kidneys were normal apart from some slight swelling of the cortex and the ureters were both somewhat dilated. The uterus contained a complete and unruptured gestation sac and the placenta was normal and not detached. The fœtus was well developed and weighed 3 lb. The cervix admitted three fingers.

Sir Bernard Spilsbury expressed his opinion that death was due to severe anæmia, but that the cause of the anæmia was obscure. Unfortunately the patient's condition precluded an examination of the blood before death nor was the bone-marrow examined afterwards; but the probability is that the condition was due to the presence in the blood of some toxin derived from the pregnancy which produced acute destruction of the blood corpuscles and inhibited blood formation.

Our reason for placing on record a case so incomplete in regard to laboratory detail is to emphasise the necessity for carrying out simple hæmatological investigations as a part of good antenatal work.

We are greatly indebted to Sir Bernard Spilsbury for his report.

ACUTE ENCEPHALITIS AND THE KORSAKOW SYMPTOM-COMPLEX.

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THE two cases described are of interest in that they both occurred within the last six months of 1931 and that both patients were disorientated and manifested the memory disorder characteristic of the Korsakow symptom-complex together with a history and clinical and laboratory findings strongly suggestive of acute epidemic encephalitis.

CASE 1.—The first patient, a single woman of 54, was admitted to the Maudsley Hospital from King's College Hospital in August of last year with a history that she had taken to her bed five weeks before with a sudden pain in the back of her head and a temperature of 103°. This pyrexia continued for some days. Prior to her admission to hospital her temperature had begun to rise at night. By night she was wakeful and restless, by day she was drowsy. Her body muscles twitched, and she was obstinately constipated.

On admission to King's College Hospital, three weeks after her illness began, she became afebrile. Her abdominal reflexes were absent and both plantar responses were extensor. She is reported to have shown a transient diplopia on the day of her admission. Her memory for recent events was poor and she remained restless at night. The cerebro-spinal fluid (C.-S.F.) contained 20 lymphocytes per c.mm. and 275 mg. of protein per 100 c.cm. Chlorides were not diminished, sugar was normal, neither tubercle bacilli nor other organisms were found, and the fluid was sterile on culture. The Wassermann reaction of her blood and C.-S.F. was negative.

On admission to the Maudsley Hospital she lay with her head flexed off the pillow and her eyes closed. When asked to open her eyes she would do so, and having replied to a few questions in a dull, slurring, expressionless voice she would quickly close them again. Her face was pale and wasted and her expression vacant and apathetic. Her left pupil was larger than her right and both were dilated, her abdominal reflexes were absent, and she had a left extensor plantar response. The muscles of her neck, thorax, and abdomen showed a quiet myoclonic twitching. There was no evidence of meningeal involvement. In the C.-S.F. the lymphocytes had fallen to 16 per c.mm. The protein was now 57·5 mg. and the Lange curve 4 4 4 4 3 2 1 1 0 0. There were no abnormal findings in her urine and the blood-urea was 13·8 mg. There was no agglutination to organisms of the typhoid-paratyphoid group.

Seen within ten minutes of entering the ward she had no memory of her journey, believing herself to be in her bed at King's College Hospital. She was also disorientated for time, and perseverated in her replies. She was not aphasic, and recognised common objects. She was slow, clumsy, and hesitant in her movements. Seen an hour later she believed herself to be in the Weir Hospital, Streatham, and had no memory of having seen me before. As night fell she became restless, and made repeated attempts to leave her bed.

There was little change in her condition till *four days later*, when she sat up in bed with flushed face and told me of her long walk to the hospital the night before, and of how she had helped herself along with a stick. She greeted a patient who sat near her bed as an old friend from Southampton, and commented sympathetically on the change in her appearance. She failed grossly in simple calculations, and was unable to repeat simple stories. Her manner was cheerful and pleasant, at night she remained restless. There was no change in her physical signs. She was incontinent of urine and fæces for her first ten days in hospital.

Fourteen days after admission the left pupil remained larger than the right, and the abdominal reflexes absent. Plantar simulation no longer evoked an extensor response. Her disorientation persisted and she continued to manifest the memory disorder characteristic of the Korsakow symptom-complex, greeting me as her family physician and describing how I had first seen her in the drawing-room of her own house.

The patient now began to make slow but steady progress, gaining weight and occupying herself quietly with knitting. Her memory defect gradually cleared up, and within three months of her admission she was correctly orientated in space and time. At no time had there been evidence of hallucinations.

Upon her *discharge* six months after her illness began, she was in good physical health and presented no physical signs suggestive of organic nervous disease. There was no evidence of recent memory defect, there was no confabulation, she was able to perform calculations accurately, and in general presented the picture of a quiet, pleasant, educated woman. It is hoped to keep in touch with her in the out-patient department.

CASE 2.—A boy of 16 was admitted to the Maudsley Hospital in January of this year. Four weeks before he had complained of feeling ill and drowsy, and was thought to have had a cold. His temperature was 100°. He remained drowsy for a week, and his parents describe him as having then become "peculiar" and "delirious." His temperature was 100° on the evening before he came into hospital.

On admission he lay quietly in bed with his eyes shut. Asked to open them he would do so, look vacantly around him and ask to be allowed to sleep. His voice was dull and monotonous. Though he lay curled up in bed there was no evidence of meningeal involvement. The C.-S.F. contained 20 lymphocytes per c.mm. and 70 mg. of protein per 100 c.cm. Neither chlorides nor sugar were diminished. The Lange curve was negative and the Wassermann reaction of his blood and C.-S.F. was negative. There were no abnormal findings in his urine.

His answer to a question was usually a drowsy nod or shake of his head. He had no memory of his journey to the hospital or of having been seen in the out-patient department that afternoon, and said that he had been in the ward for a week. He was a professional footballer, he said, who had been taken to hospital from the football field, where he had injured his knee playing for Margate. As a professional footballer he earned £2 a week. (He is in fact a shop-assistant.) He did not know what hospital he was in, and could not give the date or the day of the week. He believed the month to be October. At simple calculations he was slow and inaccurate.

He lay quiet and lethargic for four days, incontinent of urine and fæces, and masturbating openly and frequently. He then became less drowsy and would speak willingly, with a dull smile. He tended to be fatuous in his replies, saying he had been sent here by some fool, and was really as well as anybody. Now and then he would sing loudly. The left pupil was now larger than the right, and there were rapid nystagmoid movements of both eyes on looking to the right. The tendon reflexes of his right arm were more active than those of the left. Five days after admission he was seized with hiccough which lasted for half an hour. He was transferred to King's College Hospital a week after admission, under the care of Dr. Kinnier Wilson, and his condition is at time of writing, 14 days later, in all essentials unchanged save that he is now orientated for time and place. He has no memory of having been admitted to the Maudsley Hospital and says that he was taken to the ward in which he now lies because he had pneumonia.

It will be seen that both these patients presented symptoms suggestive of an encephalitis. There was no evidence that this was a secondary encephalitis occurring in connexion with disease of the meninges or with a local or general systemic infection. Neither was there evidence that it was a primary encephalitis associated with poliomyelitis. When it is considered that both patients became lethargic during a febrile attack and showed a lymphocytosis and an increase of protein in the C.-S.F., while one patient had hiccough and the other a disorder of sleep-rhythm, these facts, together with the neurological findings described above, appear to make the diagnosis of acute epidemic encephalitis a probable one. Again, the patients manifested the form of mental disorder which may be seen in toxic-confusional states (where, as is known the form of memory disturbance characteristic of the Korsakow symptom-complex may occur), and for such a toxic-confusional state no other cause could be found.

Even had there not been the findings described it is of interest that Delater and Rouquier [1] describe how a patient of theirs became disorientated in time and space after a febrile attack, presented no physical signs, and was found to show the changes characteristic of encephalitis lethargica in his brain at autopsy, while Kirby and Davis [2] in a review of the subject stress that during an epidemic of encephalitis many cases of acute psychosis are not recognised until post-mortem as having been cases of this disease.

The most common mental manifestations of acute epidemic encephalitis described in the literature are a somnolence deepening into stupor and a restless disorientation with hallucinations. Catatonic manifestations have been frequently observed. Though rare, the occurrence of the memory disturbance characteristic of the Korsakow symptom-complex is described by Kirby and Davis [2] and by Abrahamson,[3] while Hesnard [4] speaks of definite "Formes Korsakowiennes" in acute encephalitis making the important point that the true Korsakow syndrome is not manifested in that the patient does not show peripheral neuritis. Climensko [5] gives the case-history of one of his patients who was brought to him as "not right in his mind." He had a history of diplopia and of high temperature, and when seen had ptosis. This patient, who confabulated freely, made a good recovery in four weeks.

The excellent recovery made by the first of the two cases described, who left the Maudsley Hospital with no evidence of intellectual deterioration, despite having manifested mental symptoms of a gross organic kind six months before, appears to be in no way unusual. Kirby and Davis [2] were unable to find evidence of organic mental impairment in the great majority of their cases on discharge.

Had the two cases described occurred at a time when many cases of acute epidemic encephalitis were being reported, as for instance in 1918, their chief interest would have lain in the type of mental disorder manifested. To-day they raise the question as to whether similar cases are occurring at the present time, toxic-infective mental states which as has been said show few or no physical signs of organic involvement and tend to make a good recovery. It will be of interest to follow the after-history of these two patients, as the development of the familiar sequelæ of lethargic encephalitis would confirm the diagnosis.

I am grateful to Dr. E. Mapother, medical superintendent of the Maudsley Hospital, for permission to publish these cases, and to Dr. A. C. D. Firth and Dr. Kinnier Wilson for their kindness in allowing me to make mention of the progress of these patients while in King's College Hospital.

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NEW INVENTIONS

BRONCHOSCOPIC APPARATUS.

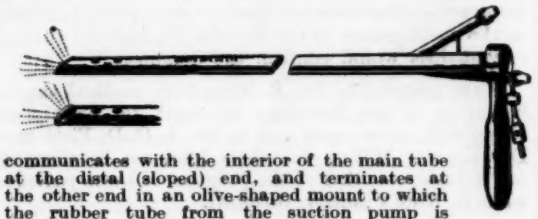
In a recent paper [1] we mentioned that we would shortly publish a description of a bronchoscope and accessories which we have had constructed for our special work in diagnosis and treatment. We found that the existing instruments each of them failed in one direction. The Haslinger bronchoscope, whilst giving ideal forward illumination with a clear vision to the terminal branches of the lower lobe bronchi, was unsatisfactory in cases of bronchiectasis and abscess, since no arrangement for drainage could be adequately added; the pus coughed out on introduction not only incommoded the operator, but obscured the mirror, rendering further observation difficult. The Jackson instrument, whilst giving adequate drainage, failed in its lighting capacity; the illumination is local and in looking down the bronchial tree one had to look through the globe of light and got very poor illumination beyond. In addition to this the Jackson instrument on account of this defect in lighting was not satisfactory for use with a telescope, neither could a telescope be conveniently adapted to the Haslinger.

The use of a telescope has not been favoured by laryngologists generally, but we may point out that without this aid vision can only be continued in parallel lines corresponding to the bore of the tube, the object to be viewed must be brought into this comparatively small area, vision up the branch bronchi is almost impossible except by excessive manipulation of the tube. By placing one's eye at the *distal* end instead of the proximal—by means of a lens—a wide view angle is obtained so that it is possible to see well up the openings; moreover, a truer view of the colour and condition of the mucous membrane is obtained. By use of a retrograde telescope a view up the upper lobe bronchus can be obtained so that the terminal branches may be examined; we imagine that we are the first to have had this view of the upper lobe bronchus and its branches in the natural position.

The new bronchoscope resembles the well-known Chevalier Jackson instrument in general appearance. The shape

[1] THE LANCET, Jan. 30th, p. 224.

of the distal end has however been redesigned to allow forward illumination by means of a special lamp. The bronchoscope consists of a rigid metal tube, the distal end of which is sloped at an angle of 50° and slightly thickened round the edge to prevent trauma. A second much smaller tube is let half-way into the wall of the main tube and carries the lighting attachment. Alongside this small tube and outside the main runs a third channel which



communicates with the interior of the main tube at the distal (sloped) end, and terminates at the other end in an olive-shaped mount to which the rubber tube from the suction pump is connected. The lamp is screwed on to a fitting carrying the electric wire connexion in the interior, and a suitable connexion for the cable at the other end. It is held in position in the channel by means of a pin engaging in a transverse hole in the handle of the instrument.

The lamp, specially designed for this instrument, produces both parallel and radial beams of light and the distal (sloped) end of the combined main tube and lamp channel is so arranged as to allow free exit to the light in all directions. A section of a bronchus approximately 3 in. long is therefore evenly illuminated and can be examined either with the naked eye or with the aid of telescopes. Of these three types are used. For ordinary diagnostic purposes the direct-vision telescope is the most useful, structures at 2 in. distance are slightly magnified (× 1·5), those nearer the lens correspondingly more. The second telescope, thinner in diameter and also 3 in. longer, is fitted with a deflecting prism and lamp. It is mainly used for the examination of the lateral bronchi and in conjunction with operating instruments. The third telescope, for retrograde vision, is solely for the inspection of the upper lobe bronchi. These telescopes are anchored to the bronchoscope by a simple pin fitting.

When pus, &c., is found in the main bronchi it is aspirated through the aspirating channel incorporated in the broncho-scope, as mentioned above. A separate suction tube with flexible tip is, however, necessary to aspirate the lateral bronchi and cavities. For some time we had difficulties in emptying constricted bronchi, since it is obviously impossible to aspirate a hermetically sealed cavity. To

overcome this trouble we devised a suction tube incorporating a very fine malleable air tube running very near to the end of the flexible portion of the main tube. We found this addition also very useful, apart from its original purpose for washing out a cavity, since the lumen is large enough to allow of the passage of non-viscous fluids such as saline. The procedure is very simple; the stopcock on the main tube is shut, a few cubic centimetres of saline are injected through the fine tube, and immediately the cock is turned the whole is aspirated.

In the construction of these instruments we are much indebted to Mr. R. Schranz, of the Genito-

Urinary Mfg. Co., Ltd. (the makers of the instruments), 28A, Devonshire-street, W.1, for the large amount of time he has spent with us in perfecting the instruments and for his mechanical ingenuity and advice without which we should have been much handicapped.

A. J. SCOTT PINCHIN, F.R.C.P.,
H. V. MORLOCK, M.R.C.P.

London, W.

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE.

COMBINED SECTIONS OF NEUROLOGY AND MEDICINE.

AT a joint meeting of these sections held on March 17th the chair was taken by Prof. A. STANLEY BARNES, President of the Section of Neurology. Prof. H. H. WOOLLARD opened a discussion on the

Visceral Functions of the Sympathetic Nervous System.

He said that most of our knowledge of the sympathetic nervous system was due to English workers. One of the most important recent advances had been the introduction of Langley's work into surgery; it had been shown that large parts of the sympathetic nervous system could be removed without apparent hurt. All workers had tried to bring the intrinsic systems of Auerbach and Meissner into relation with the extrinsic systems, but they appeared to be quite independent. The relationship of muscle tonus to the sympathetic system had broken down on anatomical grounds, as the non-medullated fibres concerned had been proved not to be sympathetic; sympathectomy did not abolish tone. Nor did the association of pain with the sympathetic system lie on any solid foundation. Every fasciculus going to a blood-vessel contained medullated as well as non-medullated fibres which might run for some distance with the vessel before rejoining the trunk. The sympathetic system appeared to exert some continuous tonic effects, while others could only be elicited by stimulation. In emergency conditions it functioned as a whole. It had certain inconstant functions at times, such as the effect on the sweat glands and in the alimentary canal. In fact, the system remained much where it had been left by Langley. The para-sympathetic might be looked on as restorative and anabolic, and the sympathetic as making more available the energy of the motor system.

The real interest had shifted from the periphery to the centre, though great difficulty was experienced in unravelling the autonomic centres in the diencephalon, partly because of its inaccessibility and partly on account of the many short neurons which made up the fibre tracts in this region. No function had been found for the pineal gland, but the basal part of the diencephalon contained a number of nuclei having the small-celled structure of sympathetic centres. The subthalamic nucleus was the interesting part in the hypothalamic complex; it seemed to have no relation with cerebrum or cerebellum. Its large cells depended for their integrity on the corpus striatum, but its small cells were regarded as an autonomic centre. The system included part of the thalamus and part of the striatum, and was believed to be associated with various metabolic functions. The importance of the hypothalamus as a sympathetic centre was supported by comparative anatomy, embryology and experimental work, particularly the condition of "sham rage," the anatomical centre of which lay in the posterior half of the hypothalamus and the most caudal and ventral part of the adjacent

thalamus. Clinical corroboration had been given by Penfield's case of "diencephalic epilepsy." Experiments on mammals suggested that the pars posterior of the pituitary had no particular function, though the evidence on polyuria was conflicting. The evidence for a hypothalamic-pituitary mechanism was very uncertain.

NERVOUS CONTROL OF THE CIRCULATION.

Prof. SAMSON WRIGHT said that workers in this country had never seemed able to accept the idea that the cervical sympathetic controlled the cerebral vessels, but the early evidence for this had been amply confirmed. Stimulation of the nerve caused marked constriction of pial arteries and a rise of blood pressure in them. The same story could be told of the pulmonary and coronary vessels, except that the vagus constricted and the sympathetic dilated the coronary arteries. The sympathetic was vaso-constrictor to the peripheral vessels, both in skin and in muscle, and sympathectomy would produce dilatation in cases of abnormal vasoconstriction; for instance, in Raynaud's disease. All the arterioles and veins of the body were under vasomotor control to an important degree. The sympathetic was vaso-constrictor to the veins, but vasodilator fibres were also found in the sympathetic fibres and in the posterior nerve-roots. Action currents had been observed in sympathetic fibres; they travelled rather slowly. Both sympathetic and para-sympathetic probably acted by liberating chemical substances peripherally—the former an adrenalin-like substance and the latter an acetyl-choline-like substance.

The carotid sinus—a dilatation at the bifurcation of the common carotid—and the aortic arch contained nerve ends the afferents from which influenced the vasomotor centre, the heart-rate centre, and the adrenalin-producing centre. The endings were extremely sensitive to slight pressure changes and might be called "buffer nerves"; they exerted a tonic inhibitory influence on the bulbar circulatory centres and reflexly adjusted heart-rate, arterial tone, and adrenalin secretion to bodily needs. Section of these nerves might cause persistent arterial hypertension, and in rabbits, a marked breakdown of the media. A rise of blood pressure, through the aortic or carotid nerves, would decrease adrenalin secretion, and vice versa. Whenever the pressure tended to alter, these nerves tried to restore it, and they functioned so effectively that extensive damage could be done with practically no change of blood pressure.

THE SYMPATHETIC SYSTEM AND THE ALIMENTARY TRACT.

Dr. A. F. HURST described the ileo-gastric and gastro-colic reflexes, saying that in the last few feet of the ileum food collected, and appeared to be actively churned and digested, only passing into the cæcum just after more food entered the stomach. The mass movement of the colon likewise only occurred just after a meal. Many cases of constipation depended on disturbance of these normal sympathetic reflexes. The œsophagus was sensitive to thermal stimuli, but the rest of the canal was sensitive only to distension. All movements depended on increased tension. Very slight tension was the stimulus causing the reflexes; rather more tension caused a feeling of fullness; and more still produced pain. Distension of the pelvic colon produced a sensation of fullness in the lower abdomen, but distension of the rectum produced the call to defæcation. In tabes more than double the normal degree of tension might be required to produce the call, and also the effect was more prolonged. The only known organic disease of the sympathetic nervous system was seen in achalasia of the cardia; the cardiac sphincter failed to relax before the peristaltic waves on account of disease of Auerbach's plexus—either active inflammation with round-celled infiltration, or degeneration. Hirschsprung's disease was an achalasia of the anal sphincter and in a fatal case a similar degeneration of Auerbach's plexus had been found.

PAROXYSMAL SYMPATHETIC OVER-ACTIVITY AND THE OCULO-SYMPATHETIC.

Dr. RUSSELL BRAIN said that sham rage could be produced by a very small incision on the medial aspect of the frontal lobe without removal of any part of the cortex. A considerable variety of attacks comparable with sham rage might occur in man and might be primarily psychical—rage or fear—or primarily physiological—epileptiform. Dr. Brain described illustrative cases. The physiological type—diencephalic epilepsy—was characterised by widespread discharge from hypothalamic centres which had been cut off from higher control. In the psychic types the attack probably started at a higher level than in the physiological types. The nervous mechanism involved played a part in such states as mania, anxiety neurosis, and toxic goitre.

The oculo-sympathetic fibres had a cortical representation in animals, both in the frontal and occipital lobes, and a descending path ran thence to the thalamus and brain-stem and to the upper dorsal segments. The fact that a terrifying sight could cause pupil dilatation presupposed these connexions. True enophthalmos occurred as the result of ocular sympathetic paralysis, which might be caused by brain-stem, thalamic and lateral medullary lesions. Over-activity of this system caused retraction of the eyelids and was often associated with central lesions in the neighbourhood of the posterior commissure. Retraction of the upper lid might be the first symptom of exophthalmic goitre, but exophthalmos could not be produced experimentally by giving thyroid or thyroxin. Dr. Brain described illustrative cases of exophthalmos after encephalitis; and of exophthalmos associated with ophthalmoplegia. Whatever might be the ætiology of exophthalmic goitre, he concluded, exophthalmos, lid retraction, and other symptoms of sympathetic over-activity usually associated with thyroid excess might be produced by organic lesions of the brain, in the absence of thyroid enlargement.

Dr. LANGDON BROWN paid tribute to Gaskell's work on the sympathetic system and said that the most important recent work had been in relating the diencephalon to the autonomic system. He quoted Cushing's description of the small deep-hidden region of the pituitary as the centre of all primitive life, vegetative and emotional, lying between the cortex on the one hand, and the ductless glands on the other. The sympathetic system was arranged to work over large areas of the body at once. The general effects of its stimulation were to prepare the body for a struggle, whereas the general effects of the cranial para-sympathetic were to conserve energy and build up reserves, the sacral portion being expulsive. When one was stimulated the other was inhibited. The rhythm of life depended largely on the fluctuating balance between the two. The two reactions to danger: violent preparation for fight or flight, and complete immobility, permitted of no compromise. We had at present hardly any knowledge of the morbid anatomy of the system, but it certainly

expressed itself in emotional disturbances. Many psychoneuroses were based on subconscious fear, and a state of continued fear was capable of producing the symptoms of which psychoneurotics complained. In many diseases of this kind the action of the sympathetic system showed dissociation or perseveration. Through interaction with the ductless glands, the sugar metabolism might be affected. Evolved in a subconscious plane, the sympathetic remained for ever beyond the control of the will.

Prof. E. D. ADRIAN mentioned the relation of the sympathetic to respiration; the tonic discharge to blood-vessels ran rhythmically in phase with respiration. The sympathetic discharge was not smoothly continuous but very delicately poised. The vasomotor centres had no specific pressor nerves; all the nerves acting on them were inhibiting. They were always being stimulated by the respiratory centre.

SECTION OF EPIDEMIOLOGY.

AT a meeting of this section on March 16th, with Prof. MAJOR GREENWOOD, the President, in the chair, a discussion was held on

Biological Prophylaxis and Treatment in Measles and Whooping-cough.

Dr. ROBERT PIERRET, in his opening address, said that physicians and doctors in private practice in France saw more of infectious diseases and had a closer concern with their prevention and treatment than did their colleagues in England, where infectious diseases were linked up with the practice of public hygiene. In consequence there had developed in France a professional outlook upon infectious disease which was more often determined by the teaching of recognised masters than by the evidence of public health records.

In *whooping-cough* there were three aids to diagnosis—namely, the isolation and culture of the Bordet-Gengou cocco-bacillus, the intradermal test, and a combined intradermal and therapeutic test of the value of which he was satisfied. For successful culture the material must be sown directly on to a blood medium. A method more successful than that of making the patient cough into a Petri dish was based on the observation that, at the onset of a spasm, the patient gave two or three coughs with the mouth closed; infected material was therefore expelled in the nasopharynx, and a specimen could be taken from this region by means of a straight swab passed through the nostril in the infant, and by means of a curved swab introduced behind the soft palate in children over 3 years. The intradermal test for whooping-cough consisted of the injection of one drop of the vaccine of Nicolle and Blaizot, in which the organism, killed by fluoride, was present in the concentration of 250 million per 1 c.cm. In addition, Dr. Pierret said, he made a practice of injecting the remainder of the contents of the 1 c.cm. ampoule elsewhere, and had found that this often arrested or reduced the cough, especially if the injection were repeated on the two following days.

The biological agents at the disposal of the medical profession for the prevention of whooping-cough were (1) serum of convalescents, (2) Nicolle's vaccine. The serum of convalescents was little used in France; results were similar to those obtained with measles convalescent serum, the action of the serum being principally abortive but relatively rarely curative. The action was more definite if the serum was given early in the disease. Nicolle's vaccine had been the subject of considerable experiment, and was being used increasingly in France. One injection was insufficient, and it was wiser to give, on alternate days, three injections of 1 c.cm. of fluorised vaccine containing 250 million organisms per 1 c.cm., and with this method he could claim 90 per cent. of successes in the protection of contacts. It was important that the vaccine should contain numerous strains, and the organisms, if not living, should not in any case be killed by heat, which reduced the therapeutic value of the vaccine. A wider use of vaccinotherapy would, in his view, stifle epidemics and render whooping-cough one of the least important instead of one of the most serious epidemic diseases. Children vaccinated before the development of symptoms or during the catarrhal stage did not acquire a lasting immunity, and might contract whooping-cough a year or two later.

The present position with regard to vaccinotherapy was as follows: (*a*) Negative or partial results were obtained if vaccines were used after the third week of the disease—i.e., after the whoop had been established for more than ten days, and when it was no longer possible to demonstrate the presence of the Bordet-Gengou bacillus. The fixation test had by this time become positive, and the patient had developed all the immunity of which he was capable. (*b*) Results were more satisfactory if vaccinotherapy was used in the second and third weeks of the disease before the whoop became established. Cough was reduced and vomiting might cease after the third or fourth day of the treatment, and occasionally there was complete repression of the disease after two to four days; treatment must be continued or recurrence of the whoop was likely. Children and infants treated by this method remained in good health, and Dr. Pierret had never seen any of the usual complications of whooping-cough in patients treated early. If insufficiently concentrated, wrongly prepared, or given too late, vaccines gave unsatisfactory results. Prophylactic doses recommended varied from one to three injections of 1 c.cm. of a suspension containing from 250 million to 5000 or 6000 million organisms per 1 c.cm., at intervals of two or three days. Dosage should be reduced to one-half or three-quarters for infants. Healthy adults in contact with the case should be vaccinated. In one case the doctor was found to be infecting his patients.

Measles was responsible for a larger total mortality than any other infectious disease. In communities of children and families the secondary cases were the most numerous, and the suppression of these would mean a great economy. Convalescent serum had no therapeutic value, probably because it was insufficiently rich in antibodies. It would be interesting to know whether convalescent serum was richer in antibodies than the serum of a person who, little by little, had been experimentally accustomed to resist the infection. Serum from nurses in a measles ward was more protective than serum obtained from ordinary persons who had had measles long before, and had not since been in close contact with cases. Convalescent serum was not necessarily free from the virus or its toxins, though their potency was inferior to the antibodies present; it was conceivable, therefore, that the injection of convalescent serum might involve a danger of infection. Valuable data might be obtained by injecting serum obtained at varying intervals after defervescence. Another objection to convalescent serum was the short duration of the immunity, protection lasting only three or four weeks. There was, moreover, difficulty in obtaining a sufficient supply of the serum and in finding voluntary donors. The donor should be

utilised seven full days after the final defervescence since the serum was richest in antibodies at that time. With a person incubating measles the injection should be made within six days of infection if complete immunisation was desired; during the seventh, eighth, and ninth days from the time of infection inoculation of convalescent serum would only produce attenuation of the attack. One difficulty lay in deciding the exact date of exposure to infection.

The donor should preferably be over 10 years, though Dr. Pierret mentioned that he had sometimes obtained blood in hospital from children as young as 3 years; he should be healthy, free from syphilis, tuberculosis, and malaria; defervescence should be complete; and precautions should be taken as far as possible to avoid taking serum from a patient in the incubation stage of another infectious disease. About 50 to 60 c.cm. could be taken from a child, and 80 to 100 c.cm. from an adult. The serum should be kept in a refrigerator for at least four days before use, to kill any treponemata, and should be subjected to bacteriological culture and the Wassermann test. Properly prepared and kept, the serum remained active for several months. Preference in its use should be given first to infants, next to children under 2 or 3 years of age; in practice, preference was also usually given to hospital cases and to delicate children, to children in families and schools, and to convalescent children. If a case of measles occurred in a hospital ward all the other children should be immunised, and the prevention of an epidemic in these circumstances was the greatest benefit of seroprophylaxis. Young children required a dose of 4 c.cm., children from 3 to 10 years 7 c.cm., and older children 9 to 10 c.cm. Whole blood was only half as active as serum. Failures with seroprophylaxis were few if the technique was adequate. General reactions, with rise of temperature, were occasionally met with, but no cases had been recorded of shock with rigor and collapse.

EXPERIENCE IN THIS COUNTRY.

Dr. J. A. H. BRINCKER said that Bordet's vaccine had been tried in whooping-cough in two L.C.C. hospitals during the past year, but the results obtained were not as favourable as those described by Dr. Pierret. In each hospital the vaccine had been tried in 100 cases, with suitable controls, but no difference had followed its use either in symptoms or incidence of complications. For some years Dr. Nabarro had been using convalescent serum for measles at Great Ormond-street with great success. Recently adult serum, obtained preferably from young men and women who had had measles earlier in life, had been used for the protection of contacts in hospitals, institutions, and residential schools, with valuable results. He was interested to learn that blood had been taken from children as young as 3 years of age. The feeling in this country had been that the young convalescent should not be deprived of blood, and hence the supply of convalescent serum was strictly limited. The injection of whole adult blood had been tried extensively in America, but the tendency in this country had been to concentrate on the use of convalescent and adult serum.

Sir ALMROTH WRIGHT thought that Dr. Pierret assumed too readily that the blood was richest in antibodies directly after the disease. In typhoid the patient scraped through with no balance of antibodies to spare. In whooping-cough, where the organism was known, it should be possible to assess the value of vaccines accurately by scientific methods, not merely by clinical impressions. The vaccine used in this country had certainly been exposed to heat, and he would like to learn a more satisfactory method of preparation.

Dr. W. GUNN noted that in France clinicians appeared to get good results with smaller doses of convalescent serum in measles than were in use in this country. He thought that possibly this was related to the indefinite views held by practitioners on effective exposure to the disease; they were inclined to regard all children in the same classroom as contacts when a case of measles appeared, although some of them were not within striking distance of the infection. This point of view would mean, of course, that more children were given the chance of protection than were actually infected, and so would improve the statistics obtained. In seeking the optimum dose of serum for protection of children in his wards, and using controls, he had found a minimum dose of 5 c.cm. of serum to be necessary. In children over 3 years the dose could be decided by multiplying the age of the child by 2 and giving the resultant number of cubic centimetres. He regarded attenuated cases as failures, because the aim was to have no further cases in the ward. He did not consider that blood should be taken from a child of less than 5 years. The results of the use of adult serum in the London County Council hospitals had been fairly satisfactory; a minimum dose of 10 c.cm. was necessary, and, beyond that, double the dosage of convalescent serum had been used. The results had not been quite as good as with convalescent serum; if adult serum was given before the third day the attack was prevented in 99 per cent. of cases; if given after the third day attenuation of the attack was secured, and after the eighth day no effect was obtained. There was reason to hope that it would be possible to concentrate adult serum, so that smaller doses would be effective. After nine to twelve months in storage the serum was known to deteriorate, but it was possible that this difficulty would be overcome by drying.

THE DANGER OF INFECTION WITH TUBERCULOSIS.

Dr. DAVID NABARRO said that his experience of the use of convalescent serum agreed with that of Dr. Pierret; the attack had been prevented in 98 per cent. of his cases, but it was not possible to say that all the children treated would have developed measles. He had recently experienced more failures, probably because he had been using serum nine to ten months old. An attenuated attack gave the patient lasting immunity, which was an advantage. Some physicians were opposed to the use of convalescent serum because they thought that in using serum obtained from children there was a danger of inoculating the patient with tuberculosis; tuberculosis was a common sequel to measles and whooping-cough in children. As Dr. Nabarro obtained his serum from adults and filtered it through a Zeiss filter he thought the danger of introducing infection was negligible. On several occasions, however, children had developed considerable reactions, with rise of temperature and malaise. He thought it most desirable to find a method of concentrating serum.

Dr. J. D. ROLLESTON said that the English experience of the value of a vaccine in whooping-cough was less favourable than the French. He thought that whooping-cough might sometimes be spread by the occurrence of unrecognised forms of the disease in adults, as in the case described by Dr. Pierret. Adult serum used in measles sometimes procured attacks so attenuated that it was difficult to say whether the patients had measles or not, and it

was even safe to leave them in a scarlet fever or whooping-cough ward.

Captain S. R. DOUGLAS said that there was no particular reason why measles should resemble typhoid in antibody formation. Following an attack of yellow fever the patient had a high degree of serum protection, and this usually lasted for life. It had been found, by experiments on distemper in dogs, that convalescent serum would give protection against a considerable amount of virus. If a large dose was given after the onset of symptoms, the temperature fell and the dog developed solid immunity; a concentrated dose given later had the same effect. The difficulty of obtaining concentrated measles serum lay in the limited supply of blood. The ideal would be to find an animal which took measles, when sufficient serum could be obtained to treat all cases.

Sir GEORGE BUCHANAN mentioned the occasional outbreaks of a type of diphtheria which was not counteracted by full doses of antitoxin. Though the notifications of diphtheria were rising the death-rate was fairly constant, and had not so far been influenced by these cases of diphtheria gravis. Dr. Pierret had suggested that Bordet's vaccine should be given in whooping-cough before the development of the whoop; how was the diagnosis to be made at this early stage?

Dr. E. W. GOODALL added that in some cases the first symptom was the whoop; how could an earlier stage then be diagnosed? He had performed autopsies on 22 children who died following whooping-cough, and in seven of these death had been due to acute miliary or acute pulmonary tuberculosis. Among autopsies on 130 measles cases tuberculosis was found in seven. He thought, therefore, that whooping-cough was more likely to be followed by tuberculosis than measles.

HARVEIAN SOCIETY.

AT a meeting of this society held at Paddington Town Hall on March 17th, the chair being taken by Mr. C. P. G. WAKELEY, the President, Sir BERNARD SPILSBURY delivered the Harveian Oration on

Pulmonary Embolism.

In some of the cases he had seen, he said, the clots had been so long that they projected beyond the pulmonary artery, into the right ventricle, death being due quite as much to interference with the function of the valve as to blockage of the artery. He proposed to draw material for his observations from 120 cases of pulmonary embolism on which he had performed autopsies, and he would show that this condition was responsible for a fair number of sudden deaths in apparently healthy persons. The main factor in the production of the thrombi causing pulmonary embolism was alteration in the flow of blood in the veins. This might arise as a result of enfeeblement in the general circulation, of diminished suction action of the chest, decrease or absence of muscular contractions in the limbs, local interference —pressure on veins—or disease of the vessel walls and varicosity. In a very large proportion of his cases sepsis had not been a factor, and even when sepsis had been present the thrombosis had been at some distance from it. He had never yet examined a pulmonary embolism which he could describe as a septic embolus. A factor in venous thrombosis which was most difficult to assess was altered coagulability of the blood; some cases of thrombosis and embolism were undoubtedly partly due to this. Coagulability was raised by hæmorrhage, crushing of tissues, and some forms of sepsis. In only one case of his series, however, could altered coagulability be regarded as the sole cause.

In a very large proportion of cases the embolus arose from a thrombus in the femoral or iliac veins; in about 90 per cent. the thrombus was in the lower limb or pelvis. Emboli did not conform to the shape of the vessel in which they lay and were generally small; the size of the little finger or of a pencil. Their length varied from 2 in. to 9 in.; their diameter varied in different parts, and they had irregular branches which did not conform with those of the vessel in which they lay. They were heaped up in that vessel, often packed so tightly that they were only dislodged with difficulty, but they were not adherent unless there had been more than one attack before death; they were sometimes solid and sometimes cylindrical or ribbon-like. The older they were, the firmer, but they were always firmer than any post-mortem clot. Usually the surface was light-coloured with a very fine mottling. Besides the fatal embolus, others might be found in the heart or in one of the main veins, and infarcts might be seen in the lungs.

Death might be due to sudden strain on the right heart or to the rapid fall of blood pressure in the lesser circulation. Even when death had occurred under anæsthesia, while the patient was being closely watched, there seemed to be variations in the symptoms; these probably depended on the size of the embolus. In some cases the right heart was paralysed and in others, with a rather smaller embolus, the diminished flow of blood through the lungs brought about respiratory distress.

ELEVEN GROUPS OF CASES.

The 120 cases in his series could be grouped according to the conditions in which embolism might occur: (1) ambulatory—chiefly old people with flabby dilated hearts and poor circulation; often the thrombosis started in varicose veins and spread up the thigh. (2) After very slight accidents in feeble old persons. (3) In serious cardiac lesions in young people. (4) In complete paralysis; one man had died of pulmonary embolism only three days after a grave injury which had rendered him paraplegic; probably because of the absence of muscular movements to promote circulation. Immobilisation of a part might have the same effect. (5) After pressure on the veins—e.g., from a hæmorrhage, abscess, or tumour. (6) In cirrhosis of the liver slowing the hepatic circulation. (7) In cases of varicose veins. (8) After the injection treatment of varicose veins; there were only three examples of this in his series, so the complication was rare. In two cases sodium salicylate and in one sodium morrhuate had been used. No evidence of local sepsis could be found. (9) In puerperal conditions—death usually occurring from the seventh to the twelfth day after labour, without any signs of sepsis. In one or two of the ten cases involution had seemed to be retarded. Sir Bernard had only one record of pulmonary embolism from over 300 cases of abortion, many of them septic. Pulmonary embolism had occurred during healthy pregnancy—usually about the seventh month, presumably as a result of pressure on the pelvic veins. (10) Under anæsthesia. In many of these cases the embolism appeared to bear no relation to the operative procedure, but in others manipulation had undoubtedly dislodged a thrombus. (11) After operation; this group was more closely associated

with sepsis than the others, but even so the clot was usually formed at some distance from the area of sepsis. In all probability the thrombosis started within 24 hours, while the limbs were stretched, immobile, and flaccid. The valves appeared to form centres of attraction for the formation of clots and the clots often showed valve markings.

One of the most important measures for the prevention of thrombosis was to put the patient in a posture which would not compress and flatten out the femoral veins. Promotion of the circulation by massage was also valuable.

HUNTERIAN SOCIETY.

AT a meeting of the Hunterian Society on March 21st, with Dr. DAVID ROSS, the President, in the chair, a discussion on the

Evolution of the Municipal Hospitals

was opened by Dr. W. BRANDER. In one sense, Dr. Brander said, the municipal hospitals had not evolved. They had been created, by a stroke of the pen on April 1st, 1930, when the hospitals previously under the control of the boards of guardians passed into the hands of the municipal authorities. The study of the development of these hospitals alongside the development of the voluntary hospitals afforded an interesting comparison. Since their student days most members of the medical profession had realised that the relation between poverty and disease was reciprocal; poverty begot disease and disease poverty. Medical, social, and economic factors must be considered in deciding the suitability of a patient for admission to hospital. There were three strata of society for which provision must be made: there were those wealthy enough to cater for illness in their own homes or in nursing homes; those who were economically sound until confronted with the additional expense of illness, and for whom the voluntary hospitals catered; and there were those who were never economically sound. Persons in the third group might be accepted at voluntary hospitals, but these hospitals had a discretionary right to pick and choose their cases. With the municipal hospitals the case was different; they were obliged to treat every case sent to them, and were allowed no discretion.

The voluntary hospitals in the early days had begun as voluntary and religious institutions for the shelter of the wayfarer and the sick. The work of the Sisters of Charity, the almshouses, refuges for the insane, and lazar houses had all led up to the foundation of the great voluntary hospitals. St. Bartholomew's Hospital and St. Thomas's were two of the oldest foundations and were originally the catch-alls for the most variegated population. Poverty was the common factor among those admitted to these early institutions, and though they undertook, where possible, the care and cure of the body, their primary concern was the care of the soul. In the fourteenth century the growth of the wool trade, the expansion of pasture land, and the Black Death were all responsible for initiating a considerable migration of the poorer classes from place to place, and it became a duty of the Church to care for them, while delinquency among them was the province of the magistrate; out of this arrangement rose the parish, which was an ecclesiastical, not a civil, unit. In 1601 the first Poor-law Act was passed, in the reign of Elizabeth. Industrial conditions were bad, and the Act remained much the same for the next 200 years. Under it, an overseer, the precursor of the guardian, compelled the collection of rates to maintain the old, the blind, and the helpless. The workhouses were foreshadowed in cottages for the idle who would not, and the impotent who could not work. In these there were intermingled the old and the young, the healthy and the sick, the sane and the insane; sanitary conditions were indescribable, and there was little care of the sick.

In the eighteenth century industrial conditions became still more acute, and landlords complained of the poor-rate. In 1843 a Commission was appointed which was superseded by the Poor-law Board and then by the Local Government Board, and finally by the Ministry of Health. In the early days of the workhouses there was no accommodation for the destitute sick except in the general wards of the workhouse; these had never been intended for the sick, and the public conscience demanded changes which were important in the evolution of the municipal hospitals. In 1868 the Metropolitan Act was passed which admitted of the provision of infirmaries separate from the workhouses. Destitute or sick persons had to be admitted through the relieving officer, and although destitution had never been defined by Act of Parliament, there began to be a relaxation in the accepted meaning of the term; guardians were told that they could judge individual applications on the evidence, and that a person might be regarded as destitute of some form of medical relief though he might not be destitute in other respects.

In a poor-law hospital in the north of England in the old days, Dr. Brander had seen the final stages of all types of chronic disease, every form of tertiary syphilis and of malignant disease too far advanced for treatment. The diseases were the same as those found in any ordinary acute hospital, but the patients were all candidates for the grave. But even before the 1929 Act the work of the poor-law hospitals had begun to encroach on that of the voluntary hospitals, though without intention or design on the part of the guardians. The primary cause was an urgent social need. At the time of the enforcement of the Act the London County Council took over 18,000 beds for acute cases, 10,000 for chronic sick cases, 15,000 beds from the Metropolitan Asylums Board, and 35,000 mental hospital beds. The standard of work in some of the hospitals transferred was equal to that found in the large voluntary hospitals.

MEDICAL EXPERIENCE IN THE MUNICIPAL HOSPITALS.

Dr. PHILIP HAMILL said that he had a great admiration for the work of the municipal hospitals. They were faced with all the cases that the voluntary hospitals rejected. It was at the municipal hospital that the later breakdowns in the course of chronic disease could be seen, and he always advised newly qualified men to take an appointment in a municipal hospital after finishing their house appointments in their own hospital. He considered that the builders of the municipal hospitals had shown great forethought when they placed the buildings in the outlying zones of London. He held no brief for rebuilding voluntary hospitals in the inner zone. There was an opportunity in the municipal service for improving the training of nurses; they could, for example, spend part of their general training at fever hospitals.

Dr. NATHAN RAW described the position in a large Liverpool infirmary 35 years ago. He had been superintendent, with four resident medical

officers. Autonomy was demanded by the Local Government Board, and he and his staff had to perform every operation required. After 17 years he had performed 8000 major operations. Eventually extra assistance was grudgingly granted, and now the hospital had a full consultant and laboratory staff. In his opinion, the National Health Insurance Act should have its own hospitals, and he thought that in future the municipal hospitals would probably be transferred to the service of this Act. The system worked well in Germany.

Dr. W. H. F. OXLEY gave the point of view of a general practitioner in the east end of London. Until April, 1930, at the local hospital three medical officers had been in charge of 300 beds, and had been so severely overworked that he had avoided sending patients into the hospital. During the past two years, however, he had had the chance to realise the opportunities of a properly staffed municipal hospital, and he thought it possible that in the future these would be the leading hospitals of the country, centres of medical education with a personnel of professorial rank like the Scandinavian State hospitals. He thought that some liaison should be made between the voluntary and municipal hospitals to improve the obstetric teaching of medical students. The obstetric material at the disposal of the voluntary hospitals was quite inadequate. He suggested that it should also be possible to secure an interest for the general practitioner in hospital work, perhaps by offering him an appointment as clinical assistant.

THE WORK OF MEDICAL SUPERINTENDENTS.

Dr. J. B. COOK mentioned some of the reforms achieved by the medical superintendents of municipal hospitals. In 1899 night nurses used to be appointed permanently in these hospitals, but thanks to the efforts of the Society of Medical Superintendents this had been remedied, and the system of alternation now in action had been accepted. It was also thanks to the work of the Society in 1898 that cases of pulmonary tuberculosis were segregated, and not placed in the acute wards. He thought some general system of insurance should be instituted so that patients could pay something to the hospital during their stay in the wards. He agreed that it should be possible to augment the obstetric experience of medical students in the municipal hospitals, and though this might be at the expense of the midwife, it was preferable that the doctor, rather than the midwife, should see difficult cases. General practitioners unfortunately found it extremely difficult to keep appointments to time, and it was essential that hospital routine should follow a time-table.

Sir BRUCE BRUCE-PORTER thought that in future the work of the general practitioner would be purely preventive, and that all patients ill enough to go to bed would be sent into hospital.

Dr. W. E. A. WORLEY found that some patients who could afford the fees of a maternity home were going into the Hackney Hospital because they knew they would get excellent attention there at much lower rates. He thought that it would help the general practitioner if he were always informed of the treatment given to his patients while in a municipal hospital; at present this was not always done.

Dr. BAILEY said that he believed that separate infirmaries were created by an order of the Local Government Board under the Poor-law Act of 1832, and not as a result of the Metropolitan Act. He quoted the definition of destitution given to the Royal Commission in 1908 by their legal adviser, from which it appeared that anyone might claim to be destitute.

Dr. J. F. HALLS DALLY asked what the future policy of the L.C.C. was likely to be. He thought that the municipal maternity hospitals might be used for post-graduate teaching as well as for the training of students. He would like to see more beds set aside for the treatment of rheumatic children.

Sir THOMAS CAREY EVANS thought the voluntary hospitals suffered through being governed by lay bodies. Their funds were in consequence not economically spent.

Dr. D. A. COLES asked what would be done in the municipal hospitals to arrange for consultations with general practitioners about the cases they sent up.

Mr. HOPE CARLTON saw no reason why a doctor should cease to practise privately because he had entered the service of a municipal hospital; in the legal profession a man was able to practise even when appointed to some official post, such as that of recorder.

A vote of thanks to the speaker was proposed by Mr. MORTIMER WOOLF and seconded by Dr. JAMES I. P. WILSON, and Dr. BRANDER replied.

NON-INFECTIVE NEPHRITIS.—Referring to our report (p. 620) of his opening remarks on this subject at the Medical Society of London, Dr. A. Arnold Osman writes: "I did not say that in examining 2000 histological sections of kidneys from consecutive post mortems that 95 per cent. had chronic nephritis of a primary type, or even of any kind. I merely mentioned that, though not an histologist, I had, as a result of this examination, reached the conclusion that the figures of Herringham and others which I quoted on the incidence of chronic nephritis in cerebral hæmorrhage, heart disease, &c., and which I believed were based chiefly on the macroscopic appearances of the kidney, were substantially correct."

CHILDREN'S HOSPITALS.—Last year 2896 children were admitted to the general wards of Birmingham Children's Hospital and to the day ward 4042; new medical out-patients, 5728; new surgical out-patients, 9416. The average length of stay was 25 days, an increase of a fraction over a day. Research work carried out in the biochemical department during the year, the report says, has been concerned largely with the anæmias of infancy and childhood and with the possible connexion between nutritional anæmia of early childhood and prenatal feeding.—The Legislative Council and the House of Keys of the Isle of Man have passed the Education (Extension of Medical Treatment) Bill. The measure extends the provisions of the Education Act as to medical and dental inspection and treatment to children under school age, and enables the Education Authority to provide orthopædic treatment for young persons up to 21 years of age. It is estimated that the continuance of an annual grant of £500 for two years will enable all the urgent and the majority of the less urgent cases in the island to be dealt with.—The annual report of the Royal Hospital for Sick Children, Glasgow, urges the provision of a completely equipped orthopædic department which would form the centre of an organisation for Glasgow and mid and West Scotland. It is also desired to establish a research endowment fund whereby the entire resources of the hospital could be utilised for consistent and sustained inquiry into the diseases of infancy and early childhood. Last year the hospital treated in the wards 5856 patients, and there were over 22,000 attendances of out-patients.—The Dowager Duchess of Beaufort has opened the new wards in the reconstructed portion of the Bristol Royal Hospital for Sick Children. Although various wards were closed last year during building operations, over 1000 children were treated in the wards and there were nearly 5000 out-patients, over 1000 of them being women.

REVIEWS AND NOTICES OF BOOKS

Diagnosis of Joint Disease.

By NATHANIEL ALLISON, M.D., F.A.C.S., Professor of Orthopædic Surgery, University of Chicago; and RALPH K. GHORMLEY, M.D., F.A.C.S., Assistant Professor of Orthopædic Surgery, Mayo Foundation. London: Humphrey Milford, Oxford University Press. 1932. Pp. 207. With 50 illustrations and 9 plates (6 in colour). 52*s*. 6*d*.

THE authors were inspired to write this book from the conviction that the diagnosis and classification of joint diseases, as it stands to-day, is inaccurate. Such observations as those made by Ghormley, that out of 41 positive diagnoses, only 66 per cent. proved to be correct, and, conversely, that out of 42 cases dismissed as non-tuberculous, 55 per cent. eventually turned out to be tuberculous, shows that all is not well with our present methods. Apart from certain histological findings in rheumatoid arthritis, upon which they lay greater emphasis than other workers, the authors do not claim to have made any discoveries; but they insist that only by investigating every case scientifically and evolving some comprehensive yet simple mode of classification can any progress be made in this most difficult subject. To this end they have collected 289 cases of joint disease during the last six years and have attempted in each case to find the answer to the questions: What is the ætiological factor? Which tissue of the joint is primarily affected? What is the nature of the change in the joint tissues? After marshalling all the facts, they come to the conclusion that in cases where the causative agent is known the type of arthritis should be registered under that head, but in cases where the cause could not be discerned, the best term for classification is that which accurately describes the characteristic primary changes within the joint. These changes could usually be grouped under two headings, proliferative and degenerative. They think that no useful purpose can be served by multiplying names to describe the same pathological process. Such conditions as we in this country variously call rheumatoid arthritis or atrophic arthritis, they prefer to place under the heading of proliferative arthritis of unknown origin, because, according to them, the primary change is a proliferative one, affecting the synovial membrane and the bone subjacent to the articular cartilage, and the atrophy, though a characteristic feature in the X ray plates, is really only a secondary change due to disuse. Similarly, what we call arthritis deformans, osteo-arthritis, or hypertrophic arthritis, they term degenerative arthritis of unknown origin, because they hold the primary change to be a degeneration of the matrix of the articular cartilage and such hypertrophic activities as exist to be secondary to the changes in the cartilage. Again, in discussing pyogenic infections, they would like to discard such variations as serous, seropurulent, and purulent, because these merely represent phases in the normal evolution of a suppurative arthritis, whatever the responsible organsim may be.

After a preliminary survey of physiological considerations, the authors proceed to discuss each group separately and at the end of each section append numerous case-histories with excellent X ray pictures and microphotographs. They quote the authority for every statement made, with the result that an extremely useful bibliography is provided and a wealth of information is compressed into a short space. No pains have been spared in the preparation of this work, and it leaves the impression of care, usefulness, and sincerity. Students, qualified or unqualified, wishing to interest themselves in this subject would find it an invaluable starting point to their researches.

Atlas du Cancer.

Neuvième et dixième fascicules. Les tumeurs des centres nerveux et des nerfs périphériques. By GUSTAVE ROUSSY and CHARLES OBERLING. Paris: Libraire Félix Alcan. 1931. Fr.80.

AN atlas in pathology may perform two useful services. The first is to provide a convenient work of reference for those engaged in diagnosis. The atlas compiled by P. Bailey and published in the Archives of Pathology and Laboratory Medicine (1927) is an example of a useful paper for this purpose. The other function of an atlas is the enlightenment of research workers in the same field, who may be greatly assisted by frank statement of convictions and difficulties. The specialist who lays his cards on the table in this manner confers a favour on his fellow workers, and this is particularly true when the ground covered is difficult and controversial, such as the classification of the gliomas. In this atlas text and illustrations are well balanced. The text is succinct and adequately descriptive; it embodies a good deal of speculation on controversial topics. The illustrations, which are mostly reproductions of water-colours, are admirably clear and instructive. The classification adopted is evidently based on that of Bailey and Harvey Cushing, but the object here is the representation of common types rather than an examination of their histogenesis or the inter-relationships between the different types. The types are correlated with those of other authors by lists of synonyms.

Much controversial matter is presented. In the drawings of the normal neuroglial elements that serve as an introductory plate, there is little appreciation of the finer structure of the oligodendroglial cell, and the student would find it difficult to distinguish it, in practice, from a small astrocyte. It is peculiar, too, that the method quoted for the demonstration of these oligodendroglial cells is a modification of a method that is selective for astrocytes—namely, Cajal's gold chloride sublimate method, rather than Hortega's specific silver carbonate method for oligodendroglia. This may possibly explain why the authors have encountered the unusually large proportion of 16 oligodendrogliomas in 251 cerebral tumours. Moreover their "oligodendrocytome à cellules fusiformes" is admittedly the type called by Bailey "spongioblastoma uni et bipolare." The cells of this tumour do not stain in the same manner as oligodendroglia, and hence the tumour would not be acceptable to most workers as an oligodendroglioma of any kind. Undoubtedly in this grouping the authors have been swayed by the theory that underlies their designation of the nerve-root tumours as peripheral gliomas. This theory is based upon two assumptions: the first is that the neuromas are tumours of the sheath of Schwann cell, the second that the sheath of Schwann cell is of ectodermal origin and therefore perhaps homologous with the oligodendroglial cell. Neither of these hypotheses is

well supported by observation, although the second enjoys a good deal of popularity in some quarters at the present time. Most pathologists, for the present at any rate, will prefer the theory that the neuromas are fibroblastic tumours, since this is in accordance with the evidence of differential staining.

Another distinctive point of view is found in the authors' designation of the cerebellar medulloblastoma as "neurospongiome." This nomenclature is based upon original work, as a result of which the authors claim that a large proportion of the cells in these tumours possess the staining reactions of neuroblastic cells. They resemble the small granular cells of the cerebellar cortex. This work is of considerable importance and, if confirmed, will greatly advance our knowledge of these tumours.

The interest of this atlas to the specialist is obvious. Those who are more concerned with the recognition of types of glioma in the course of routine work will also find it valuable; the authors show that much may be achieved in such recognition by the use of routine staining methods. They do not, however, belittle the importance of using a variety of different methods if a satisfactory analysis of the cytology of these tumours is to be obtained.

An Introduction to Tropical Pathology.

By T. BHASKARA MENON, M.D., M.R.C.P., Acting Professor of Pathology, Medical College Vizagapatam. With a Foreword by Major-General C. A. SPRAWSON, C.I.E., V.H.S., M.D., F.R.C.P., LL.D., I.M.S. Calcutta: Thacker's Press and Directories, Ltd. 1931. Pp. 210. Rs.10.

THIS small book, according to the preface, is intended mostly for undergraduate students in the tropics. It has but few pages, the type is large, and since many illustrations are included there is not much solid substance in the fare provided for the reader.

The author's opinions with regard to the infective stages of *E. histolytica* mentioned on p. 65 will not meet with general acceptance and the description of the pathology of blackwater fever might be considerably expanded. To bring the chapter on sprue up to date much more would have to be said about the types of anæmia and bone-marrow changes than the author has found room for. There is indeed little pathology in this book which is not dealt with at least as fully in the standard text-books on tropical medicine, and the absence of a fuller description of symptomatology in relation to pathology tends to make even this short book difficult to read. The illustrations are clear and the microphotographs are well reproduced.

Text-book of Gynæcology.

By SIDNEY FORSDIKE, M.D., F.R.C.S. London: William Heinemann, Ltd. 1932. Pp. 290. 15*s*.

THIS small book is intended for the use of students and practitioners. It is clearly and concisely written, the print is good, and the illustrations are exceptionally well produced for a text-book of this size. The views expressed are thoroughly conservative and will be generally accepted; the general arrangement of the material calls for no comment. On the other hand it is doubtful if students will obtain all the information they require for their final examinations from a book of this scope. Moreover, the compact style makes the assimilation of the subject matter a laborious process and demands much concentration. The popular standard works for the student of to-day are either comprehensive text-books or synopses, and there is much to be said for this grouping. This book is neither one nor the other. Mr. Forsdike's contribution might be of service to students who are starting their gynæcological appointments, for it will enable them to get a general survey of the subject with reasonable ease; he might with advantage develop a more ambitious volume on the same plan, for the subject is admirably presented and the general style is far above that of most books of this size. A few minor criticisms might be made. It is not customary to classify follicular and lutein cysts of the ovary under the heading of benign cystomata, and the material in the chapter on embryonic tumours requires rearrangement. The chapters on radium treatment, post-operative treatment, and gynæcological therapeutics are particularly good.

Practical Morbid Histology.

A Handbook for the Use of Students and Practitioners. Second edition. By ROBERT DONALDSON, M.A., M.D., Ch.B. Edin., F.R.C.S.E., D.P.H., Sir William Dunn Professor of Pathology in the University of London; Hon. Pathologist, Guy's Hospital. London: William Heinemann, Ltd. 1931. Pp. 487. 42*s*.

THE author has greatly improved this work by introducing illustrations into the second edition; the first was not illustrated and was therefore not likely to appeal strongly to students. This new edition, with over 200 beautifully reproduced drawings, should prove much more attractive in spite of its increased price. In the subject matter a number of additions and alterations have been made. The author's original intention was to confine the work to descriptions of histological appearances, thus providing a guide to the study of morbid histological sections; but the scope of the work has now been extended. Concise accounts of the pathology and of the morbid anatomy of the lesions are included as well as descriptions of their histology. A short section on parasitology and also a 40-page section on histological technique and stains have been added. The work is now a fairly comprehensive text-book of practical and special pathology; the subject is treated in a sound and orthodox manner, the writing is clear, and the essential points are well represented. The illustrations, all but two of which were drawn by the late Mr. Richard Muir, of Edinburgh, are mostly excellent; they possess that degree of the diagrammatic which gives the most effective interpretation of histological structure to the beginner. An unfortunate feature of the book is that these illustrations are not used to the best advantage. The author's opinion that illustrations are not really necessary in a book of this kind is recorded in the preface, and he has allowed this view to interfere with the proper development of the work; for, although he has inserted the illustrations, he has made no attempt to correlate his text with them. No reference is made to them, nor are they directly used to illustrate particular points discussed in the text. On pages 12 and 13 for example, the note on the plasma cell which describes its structure and appearance in some detail, gives no reference to the picture of a plasma cell on page 2. As a result of this incoördination many opportunities of simplifying the teaching of the subject are missed, and the whole book shows a lack of cohesion between component parts. Apart from this the teaching is sound.

THE LANCET.

LONDON: SATURDAY, MARCH 26, 1932.

THE PROBLEM OF CONVALESCENCE.

ILLNESS which neither terminates in death, nor drags on indefinitely without prospect of recovery, must pass through a stage of convalescence. It is during this stage, as ELIA inimitably showed, that the mutual bond between doctor and patient is apt to weaken, and as a consequence, the cure is often imperfect or needlessly delayed. The doctor, on his part, has labelled the case with a diagnosis, has finished all the urgent and most interesting part of the treatment, and knows that the patient is out of danger and should get better. Other acute cases, with their pressing calls on his time and thought, drive its memory from his mind, or he may feel diffident in urging further attendance and consequent expense to the patient, or on the other hand feel it unjustifiable to retain him in the occupation of a hospital bed. The patient, on his part, is reluctant to trouble, or to pay, the doctor more than is absolutely necessary and feels he must get back to work. This attitude may result in too early a return, an imperfect cure and possible relapse, or a long period of indifferent health. Among insured patients the opposite may happen. A middle-aged labourer, with wife and family, brings down a hernia at his work. He is put on the waiting-list of the local hospital and spends some weeks in idleness and anxiety about the operation he has been told he requires. In due course he is admitted, all goes well and he is discharged in three weeks with the injunction to take things easy for a time. He spends more weeks in idleness, reporting to his panel doctor for certificates at intervals, and inspecting his well-healed scar with profound distrust. Before long he is badly out of training, and has lost confidence in himself and broken his once well-established habit of regular occupation. When, and how, shall he return to work? To advise light work is useless: it is not to be had; with the labour exchanges crowded with able-bodied men, who will give him employment? So, with his family dependent on him, he clings to the slender income of sick benefit, rather than launch out into the stormy waters of the labour market, and another case under the Workmen's Compensation Act is added to the list at the county court. The man is neither a malingerer, nor the victim of traumatic neurasthenia, though he may be described as such by the opposing lawyers; he is suffering from the lack of a properly regulated convalescence.

In most districts the present hospital accommodation is adequate for the treatment of acute cases, but many patients are retained for a time, in the general wards, after they have ceased to require active hospital treatment, because they clearly are not fit to return home. And there is no alternative. The rate of turnover of the hospital beds is retarded and a long waiting-list accumulates. The usual solution suggested for this problem is the building of fresh hospitals and the enlargement of the old ones. But such a procedure is uneconomical while it does nothing to reduce the numbers of half-cured and semi-chronic invalids. The right solution would be to set up in connexion with every large centre an establishment specially designed, staffed, and equipped for the treatment of convalescent cases. In this country there are very few such establishments, although, for instance, the Astley Ainslie Institution attached to Edinburgh Royal Infirmary is a happy exception and an inspiring example. Many of the larger hospitals have annexes, on the outskirts of the towns they serve, which to a point supply the deficiency; but they can take only a small proportion of hospital patients and, unless large, they cannot work with economy or efficiency. What then are the requirements which an ideal institution should possess? First, no acute cases must be admitted, nor any case suffering from an incurable condition. The centre is not equipped to deal with the former and the latter will tend to dispel the atmosphere of optimism and steady progress to full recovery which is one of a good home's most powerful therapeutic assets. Secondly, it should be subdivided into sections to deal separately with various special conditions—cardiac, post-operative, orthopædic, nervous, and so forth; for each will want, to some extent, specialised treatment. Thirdly, it should be large enough to ensure that no case need be discharged before it has obtained the maximum of benefit obtainable. Lastly, it must possess ample facilities for providing, and enforcing, graduated recreation and work, both mental and physical. The last factor is, perhaps, the most important and difficult of all. It entails the organisation of games and physical exercise, garden work, farm work, and a variety of indoor trades and occupations, and the permeation of a tradition of discipline and morale so that all the inmates carry out conscientiously the tasks set them. Such an ideal is by no means unattainable. It is seen in a number of the best sanatoriums for tuberculosis, and on an even larger scale in such colonies as Enham and Papworth.

Finance is the rock on which such schemes founder and the present time of depression does not seem an auspicious one for the launching of such ideas. But there are certain aspects on the financial side which merit consideration. It should not be difficult to find buildings and estates which, with comparatively little adaptation could be made ideal. Throughout the country there are large houses, with grounds and farms attached, for sale at grotesquely low prices. The cost of maintenance will naturally be very much less than that in a general hospital, for fewer and less highly trained nurses will be needed, and the overhead charges and cost of equipment will be low. If properly organised, the institution should be able to keep itself in garden and dairy produce, do its own laundry and cleaning by the work of the patients, with the minimum of paid supervisory officials. Some

money no doubt will be required, and it should come, in large part, from health insurance companies and societies. At the present time the greater number of these make no direct contribution to the hospitals for the treatment of their members, relying on the ratepayer and private charity to supply this most costly se. for them. They would in any case save much in sickness payments, for patients would recover more quickly and completely their full working capacity, the number of cases of so-called traumatic asthenia would decrease; county court actions would become fewer, for no patient could, and few would, wish to maintain they were unfit after a period of full work at the convalescent institution. A further contribution should come from local borough and county councils. Such an investment should yield a quicker return in good health than much of the money now spent, for instance on tuberculosis; while the greater rate of turnover at the general hospitals would save the expense of adding to their existing number of beds. Finally, the patients themselves should pay something, however small; for it is human nature to undervalue benefits which come for nothing, and a small payment would be an incentive to take their treatment seriously.

Some may doubt perhaps how amicably municipalities and health insurance companies would work in double harness. Should they prove an awkward team, other methods of raising money might have to be devised. However established it would, we believe, soon appear that large convalescent centres are in the main an economical addition to the health services by completing the fine work now being done in the general hospitals.

ANÆMIA.

LECTURES seem to be coming into their own again. They were at one time occasions of moment; scholars and students were few and scattered with small opportunities of conversational intercourse; the printed word was occasional and copies scarce, so that lectures and discourses were the means by which learned men passed on their erudition to those who were curious enough to want to know. Their importance may be taken to have steadily declined during the nineteenth century, certainly in its second half. Their enormous increase along with the great extension of university teaching led perhaps inevitably to a decline in their quality, and it was often more pleasant and at least as profitable to get the information from the abundance of printed matter which had become available. But in the present century, and in the medical sciences especially in the last ten years, this print has become unmanageable and serious students may not know even where to look for the information they want, and hardly anyone who is personally involved in working in some small corner of his own has the chance as well as the inclination to know what is going on elsewhere. Lectures are therefore coming in again either to give an expert's views on some special topic or to suggest generalisations derived from varied fields, and if we may judge from the audiences which have lately gathered at the College of Physicians and elsewhere it certainly seems that London students, young and old, are coming to value good lectures more than they did a few years ago. We say good deliberately, for lectures now are not readings. The lecturer must needs have a tale to tell, but how he tells it matters quite as much as what he has to say. Whatever his particular technique, personality and sincerity are as desirable as orderly clarity. A good lecture seems indeed to have much the same qualities as a good sermon, and it would probably be idle to attempt any clear distinction between them.

Those who heard the Goulstonian lectures on the pathology and treatment of anæmia given lately at the Royal College of Physicians of London by Dr. L. J. WITTS, of Guy's Hospital, will we believe appreciate the reasons for the foregoing reflections. Those who read them in this and the preceding numbers of THE LANCET will do no more than recognise a singularly interesting account of a subject which has advanced greatly in recent years. It is not so long ago that there were only three sorts of anæmia—pernicious, chlorosis, and secondary. And if nothing fresh had since been added there would now be only two, for chlorosis has disappeared; we should dearly like to have it back for a while that it might be investigated by modern methods. It is possible, but sadly unlikely, that some cult of Victorianism among young unmarried women may bring it to light again. Dr. WITTS in fact does not mention it at all, which is perhaps why he also omits all reference to the distinction, made so clearly in chlorosis by LORRAIN SMITH, between anæmias due to an excess of plasma and those in which there is a real defect in the hæmoglobin of the erythron.

The most important contribution to our understanding of the anæmias is we think his attempt to bring together a whole series of apparently different conditions under the general heading of anæmia from defective nutrition or disordered assimilation, with the idea that some specific substance or substances are needed for each of the developmental stages of the normal red cell. We have on the one hand the simple nutritional anæmia so common in infants, which, as Dr. HELEN MACKAY has shown, is due to the low iron and mineral content of milk and can be cured by a mixed diet and inorganic iron salts; these supply the substances which are necessary for the proper maturation of normoblasts into normal erythrocytes. On the other hand there is Addisonian pernicious anæmia in which the stomach fails to secrete a ferment which produces from meat a substance, normally stored in the liver and kidneys, which is necessary for the development of megaloblasts into normoblasts; intestinal derangements which prevent the absorption of this substance may have the same effect when the gastric juice is normal. The due differentiation of the blood-cells is as it were blocked at a certain point and, as Dr. WITTS points out, the accumulation of iron in the liver and spleen is due not so much to excessive destruction of red cells as to the failure of the marrow to make use of the materials for making fresh red

corpuscles which are available. It may well be, as he suggests, that this substance has a general influence on the metabolism of iron which is a necessary constituent of every cell in the body, and it is a striking and significant clinical fact that the first effect of giving liver to an untreated case of pernicious anæmia may be a great improvement in his sense of well-being two or three days before there is any perceptible change in his blood; he sits up in bed and asks for the newspaper and a cigarette without any alteration in his percentage of hæmoglobin or his reticulocytes, and it is difficult to believe that his general symptoms are due solely to anoxæmia. The connecting link between these two extremes is found in the anæmia with a low colour-index which occurs almost exclusively in married women, is much aggravated by pregnancy, and can be cured with massive doses of iron but not with liver. It has no satisfactory name; "microcytic anæmia" and "simple achlorhydric anæmia" both have the general disadvantages of all definitive names, and other anæmias have small cells, while about a fifth of the examples of this disease have not got achlorhydria. Considering that Dr. WITTS has been chiefly responsible for the recognition and study of the condition in this country, "Witts's anæmia" would be a convenient label until we know enough to fit the condition into some completely rational scheme. He has made too the fine discovery that the gastric juice contains the ferment which will generate from beef the substance which is missing in pernicious anæmia, though it has as little acid or pepsin as in Addisonian anæmia. Hence the megaloblasts can mature to normoblasts and the patient can be cured with ample supplies of the iron which is needed for the transformation of normoblasts to red cells.

These very substantial advances in knowledge have been due in the main to the intelligent use of two technical procedures—fractional test-meals and the precise measurement of the sizes of red cells inaugurated by Dr. PRICE-JONES. In minor degrees the exact enumeration of reticulocytes is a distinct improvement over the rather vague determination of polychromasia, and Dr. PIJPER's diffraction method has been very useful in giving an easy, if rather rough, method for ascertaining cell sizes. The study of red cell diameters has given us criteria for the identification of the different anæmias much more definite than we had before; the stomach-tube is mostly responsible for our new knowledge of the causation of those which depend on misfunctioning of the bone-marrow. Normal gastric juice contains acid, pepsin, rennin, and the hæmatinic ferment, and the products of its action are absorbed from the intestine. It may fail in various ways, most commonly in middle life. If it fails completely, we have megaloblastic Addisonian anæmia, and we get the same result if, as sometimes happens, the hæmatinic ferment fails while acid and pepsin continue or if bad intestinal absorption frustrates adequate gastric digestion. If it fails in everything but the hæmatinic ferment, we are likely to get Witts' anæmia owing to defective absorption of iron. The interplay of these considerations makes it easier to understand why a case of simple microcytic anæmia may develop into megalocytic pernicious anæmia and, occasionally, vice versa, and why some people with achlorhydria are quite well.

Finally, we would draw particular attention to the group of hæmolytic anæmias described in the third lecture. We have here pretty plainly an uncommon disease which needs much further study—so uncommon that combined effort is needed for its elucidation. Some examples have the characters of a subacute infection, and if the patient survives there is no prospect of a recurrence; the marrow is active and responds as it normally does to loss of blood. Rare and obscure diseases are apt to be put on one side until someone has provided some sort of background on which they may be looked at, we hope that Dr. WITTS has done this has roused an interest in a condition about which we want to know more.

THE STORY OF THE TUBERCLE BACILLUS.

FIFTY years ago last Thursday ROBERT KOCH showed the Physiological Society of Berlin the organism of tubercle which had until then eluded search. Others before him, especially COHNHEIM, had insisted that tuberculosis was a chronic infectious disease due to a specific organism, and the closely related lepra bacillus had already been discovered. Systematic botanists of the time, like v. NAEGELI, mocked at the part attributed to microscopic vegetable life in the causation of disease, regarding it as akin to the personification of the elements by primitive peoples. KOCH however brought the bacilli within range of his microscope lens by means of prolonged staining in alkaline methylene-blue and counterstaining with vesuvin which discharged the blue colour from all the tissue elements except the tubercle bacilli. He saw the blue rods first on a coverslip preparation of miliary tubercle accidentally left in contact with methylene-blue for 24 hours in an ammonia-laden atmosphere. He found that this peculiarity of being rendered visible by the combined action of methylene-blue and vesuvin was possessed only by the bacilli of tubercle and of lepra. Commonplace though that may now sound, this first essay in bringing out by staining methods differences between organisms otherwise so similar was, as our leader writer hazarded at the time, the inauguration of a new era in our knowledge of the ætiology of diseases and in the organisation of measures for their prevention.

ROBERT KOCH.

Now if KOCH had done this and no more than this, March 24th, 1882, would still be an important date. But, statesman that he was, he did not publish his discovery until he had found these blue-fast bacilli not only in recent miliary tubercles

but also within the giant cells, in the walls of tuberculous cavities, in the sputum of phthisical patients, in degenerated "scrofulous" glands, in "fungous" joints, and in the bones of tuberculous cattle. They were never absent in the granulomas produced by inoculation of tuberculous material even in animals of the most different species. More than this, he had already carried on an extensive series of cultural experiments which yielded striking results. Employing sterilised blood-serum from the ox as a medium, he had cultivated the bacillus from fresh miliary tubercles, and had kept some of these cultures going for 200 days. More than this, he had gone far to satisfy himself of the validity in the case of tubercle of the postulates for a specific infection which have since been known by his name. It is a curious and rather painful reflection that much of what KOCH had actually discovered before he made his demonstration to the Berlin Physiological Society was overlooked by his successors, and was "rediscovered" afterwards in various research laboratories. In a commemorative address [1] PFEIFFER remarks that the intervening 50 years have added scarcely anything material to KOCH's work. Having definitely established the parasitic nature of tuberculosis, KOCH went on to consider whence the organisms came and how they got into the body. From the fact that the bacilli develop within a narrow range of temperature, roughly 30° to 41° C., he deduced that the organism is a true parasite, incapable of developing outside the body. He regarded the germs as entering the system by the inspired air, possibly adhering to the particles of dust which are carried along with it, and he discussed with great discernment what can be learnt from the fact that to render an animal with certainty tuberculous he had to insert the infective material into the subcutaneous tissue, the peritoneal cavity, or the anterior chamber of the eye, infection from the surface of a wound only occurring exceptionally.

KOCH's announcement spread over the prescient world with astonishing rapidity. It was on May 8th, 1882, only six weeks after the original communication, that Mr. WATSON CHEYNE demonstrated in the pathological laboratory at King's College, London, the bacilli brought over to England by Dr. GOLTDAMMER, KOCH's private assistant, when among the 70 people present were LISTER, WILKS, PYE-SMITH, and BEALE. A culture of tubercle on blood-serum was shown on May 10th at the soirée of the Royal Society of London. Thereafter the tubercle bacillus soon became familiar to every medical student, not, it is true, in the original blue-brown method, but in the familiar garb of scarlet introduced by ZIEHL and modified by NEELSEN. It was a simple matter to try other mordants than potash, which was soon replaced by aniline water with gentian-violet, and then carbolic acid with fuchsin. To add only two scraps of history. It was SAMUEL WEST who first did routine tests for tubercle bacilli in sputum, at the Victoria Park Hospital. VINCENT HARRIS, who was then remounting specimens of diseased lung in the museum of St. Bartholomew's Hospital, was able to demonstrate in sections, some of them 50 years or more old, the presence of tubercle bacilli almost every time. And so in every country KOCH's teaching was a similar turning point in the relation of humanity to disease. Economic conditions in Germany have led to the postponement to 1933 of any large-scale jubilee celebration, but during the last week or two the chief general and special German medical papers have contained appreciative articles.

[1] Med. Welt, March 5th, 1932, p. 325.

ANNOTATIONS

SEX EDUCATION

WE publish this week a letter from the honorary medical secretaries of the British Social Hygiene Council announcing a departure on the part of the Council which may prove to be of wide utility. That many of the troubles arising in connexion with marriage would be prevented by greater physiological knowledge on the part of the contractors has been recognised by the medical profession for literally ages, and by a considerable proportion of thinking laymen for at least a century. To-day it has become universal knowledge, and a profuse literature is available for the public digestion purporting to give the necessary information. The quality of these books varies much, but far more of them are useless than useful, some are mischievous, and some are designed to bring the return in money earned by salacity. Knowing the unsatisfactory nature of many of these books, it is good to learn that the Council proposes to publish an authoritative manual dealing with the personal problems arising out of marriage, while they are also approving of an arrangement by which those in need of private advice can obtain the aid of the secretary general of the Council, at a bureau of consultation. The "Personal Problems" bureau will be under Mrs. Neville Rolfe in her individual capacity, and will be established on a commercial self-supporting basis, part of any profits accruing being given to the Council for its general purposes. We understand that the bureau is intended to have a larger scope than the consideration of difficulties incidental to marriage. Parents, for example, who may wish for assistance as to practical methods in the sex-training of their children will also be welcomed, and afforded advice of the sort that, for this reason or that, they no longer seek as a matter of course from the doctor or clergyman. With regard to the assistance of ministers of religion in settling questions of the sort, the report of a Lambeth Conference has now definitely stated what the public had for some time come to think—namely, that on such subjects as preparation for marriage admonitions could not be given by unmarried clergy with much chance of their being sensible. More than ever is this true now that the sex education and sex adjustment have been diligently studied as special subjects. It is not only clergymen, married or unmarried, who are unlikely to have at their disposal sufficient knowledge to give sound advice in such

matters, for many medical men feel that they are in the same position, and require to give more intensive consideration to the different aspects of sex and family relations before their views should be allowed to influence the lives of others. For this reason it seems possible that of those seeking the bureau for assistance as many may be directed there by their doctors or their clergymen as will find their way there independently.

HEALTH OF THE NAVY IN 1930.

THE statistical report of the Health of the Navy for the year 1930,[1] the first to be signed by Vice-Admiral R. St. G. Bond, has just been issued. The total force was 88,840 (86,240 in the preceding year), marines at headquarters being included for the first time. The fresh cases were, per 1000, 428·08 (482·03), the invalids 12·55 (14·30), and the deaths 2·47 (2·94), all showing decreases. Important causes of loss of service were local injuries and wounds, acute gonorrhœa, and, with less loss, catarrh. The chief causes of invaliding (total, 1115) were pulmonary tuberculosis 202 (228), diseases of the eye 199 (170), diseases of the ear 91 (132), injuries 80 (105). Deaths were 220 (254), their chief causes being injury 94 (92), pneumonia 16 (21), pulmonary tuberculosis 13 (19), heart disease 13 (7), and diseases of the intestines 12 (15). There were no deaths from enteric this year or last, but 7 (12) from meningococcal infection. Of the deaths from injury, 39 (42) were due to drowning; there were 14 (9) suicides. Of cases of illness, 11 (5) were due to the enteric group, 383 (1661) to influenza, 388 (539) to malaria, 5 (14) to Mediterranean fever, 115 (179) to pneumococcal infection of the lung, 78 (100) to pyrexia of uncertain origin, 118 (128) to rheumatic fever, 47 (81) to sandfly fever, 1 (2) to small-pox (a slight case, sent back to duty in 19 days), 203 (240) to tuberculosis of lung, with 13 (20) unclassified. New venereal infections were 5154 (5342), a definite reduction. From the new tables we gather there were 5 cases of encephalitis lethargica; single cases are mentioned of blackwater fever, relapsing fever, tetanus, and of schistosoma from the Mediterranean, though none from China. The death-rate from disease (1·26) is the lowest hitherto recorded. The successful preventive measures in *Delhi* for her cruise up the Amazon (chiefly mosquito nets) are given in detail; no cases of malaria occurred. Of meningococcus infection the largest group was 6, from *Pembroke*, depôt-ship at Chatham. Eight years ago we observed[2] that there was no special notice taken of tuberculosis in the health reports of the Services, though the disease was causing them a loss of 721 men annually. Much attention has been paid to this subject meanwhile, but if we go back to the Navy Health Report for 1921, then current, and compare its figures with those for 1930, we see little evidence of improvement; there are indeed slightly more cases and more invalids.

Statistics of Tubercle in the Navy per 1000.

	Cases.	Invalids.	Deaths.
1921	2·36	2·23	0·28
1930	2·42	2·36	0·16

Tuberculous cases and invalids are almost, as we see, the same people, and as the Navy publishes a most useful list of the ages and length of service of all invalids, the distribution of cases in the service can be readily calculated. It emerges that since 1921 the distribution of cases has been changing. Half the men in the Navy have under 10 years' service, and half have more. In the years 1921–24 the tuberculous invalids of under 10 years' service averaged 123, those of over 10 years' service 71. In the years 1925–30 there were on an average 105 of under 10 years' service and 96 over. It would appear that the men on the whole are developing tubercle later in life. Either there is a greater risk of contracting tubercle in the Navy as service continues, or the improved hygiene of to-day strengthens the resistance of those fated by their childhood's experiences to develop tubercle and delays its appearance. The question certainly deserves discussion. It must not be forgotten that the death-rate for tubercle among men in England and Wales rises pretty regularly from age 15 to age 55, so these men are serving at the most susceptible ages, and that there is a school of medical opinion which holds that most of the tubercle of the Services has come into them from civil life. Of the great groups of the Service, marines, with 1·16 cases per 1000, were least attacked in 1930, seamen, with 2·49 cases per 1000, the most. There are fewer cases of venereal disease this year, though more days under treatment, but these are only a fifth of the total from all diseases and injuries; formerly they were a third. The long accounts of work being done in pathological and other laboratories have interest, but the first-hand clinical reports of cases and epidemics seen on foreign stations, the special characteristic of the old reports, are excluded to-day, which is a great loss. Much information of value was extracted from them in the Croonian lectures of last year. The note on diphtheria strongly supports the slogan, "Prevention pays!" The cases of diphtheria at Greenwich Hospital School used to cost about £1500 a year, but thanks to Schick-testing and immunisation there are now no cases; to maintain this condition costs but £30 a year or less. Reports from Malta support Ziemann's view[3] that leguminous crops which form coumarin are a great protection against malaria, and that it is their presence that protects Malta from malaria. At Haslar, which has 150 more beds this year, an electrocardiograph has been installed. The many mosquito-breeding places that surround the hospital are utilised for training surgeon-lieutenants in antimosquito work. The volume of dental work is continually increasing. There is still no mention of the health condition of the cadets at Dartmouth.

[1] Statistical Report of the Health of the Navy 1930. H.M. Stationery Office. 1932. Pp. 148. 2s. 6d.
[2] THE LANCET, 1924, ii., 664.

ANTIMENINGOCOCCAL SERUM IN CEREBRO-SPINAL FEVER.

THE scheme designed by the Ministry of Health[4] to determine the value of serum treatment during the present prevalence of cerebro-spinal fever has failed as yet to secure really useful records, and a new leaflet has been issued to medical officers of health explaining why. A particular object of the scheme was to compare the potency of different serums in current use. Through the courtesy of medical officers of health, hospital medical officers, and medical practitioners, over 300 individual case records have already been received; the variation in the methods of using the serum have made them difficult to compare. The doses of serum given, the period of the disease at which serum treatment was begun, and the time during which it was continued, have differed widely from the practice of serum

[3] See THE LANCET, 1931, ii., 255.
[4] Review of Certain Aspects of the Control of Cerebro-spinal Fever (Ministry of Health Reports on Public Health and Medical Subjects, No. 65).

treatment as set out in the Review, which followed the original indications given by Flexner and many subsequent authorities. These authorities advocate lumbar puncture as soon as the disease is suspected, and the intrathecal injection of serum without waiting for bacteriological confirmation or typing. The doses should be about 30 c.cm. (or 10 c.cm. of concentrated serum) for adults, and only slightly less for older children; general anæsthesia increases the amount of cerebro-spinal fluid obtained, and hence the injection of full doses of serum without risk of increasing the intrathecal pressure. The injection should be repeated every 24 hours for three or four days, until convalescence is obviously established, and recommenced if relapse occurs. Though individual cases require exceptional treatment, any great divergence from accepted practice obviously reduces the value of case records collected for the purpose of assessing the therapeutic potency of the serum now available, and of contrasting the curative effect of one serum with another. Less than half of the records hitherto received show evidence of even approximate compliance with accepted practice. It is very desirable that the further case records furnished should, wherever necessary, be accompanied by some notes of the reasons which have seemed to make it impossible or undesirable in the particular case to give serum early enough, in sufficient doses, or sufficiently long to secure its full benefit. The case reported by Dr. Burton in our present issue emphasises both the message that long-continued treatment is required, and that treatment cannot always be on routine lines. The patient described, after being in hospital for more than 17 weeks, during which time he had two relapses, made a complete recovery, mental and physical, but not until 78 lumbar punctures had been performed and 2601 c.cm. of cerebro-spinal fluid removed. The serum seemed to have little specific action in this case. A variation of technique to meet special circumstances must obviously continue, but while this inquiry is in progress an obligation rests on medical men to adopt a scheme which will make their results comparable unless this is definitely contra-indicated.

CURABILITY OF CANCER OF THE STOMACH.

THE prognosis as regards cure of cancer of the stomach is poor, yet D. C. Balfour,[1] of Rochester, Minn., is able to present an analysis of 128 patients, operated upon between 1910 and 1920, who survived partial gastrectomy for ten years or more. It was found that the cancer was removable in 19 per cent. of the cases seen, and of those in which it was resected about 20 per cent. survived for at least ten years. A. J. Walton,[2] in a series of 62 partial gastrectomies, found that only four (including one case of sarcoma) survived four years or more in spite of radical operation, whereas in some of the cases reported by Balfour only a local excision was done, and of these six survived the ten-year period. The grading of the tumours in the 128 cases "cured" confirms the value of microscopical grading as an aid to prognosis and as an indication for resection. The site of the tumour has a marked influence on the possibility of removal. Lesions at the upper limit of the lesser curve are very unfavourable, and from the study of these 128 cases Balfour finds that lesions of the antrum are less favourable than those of the body, since in the pyloric region the lymph glands are extensive, early involved, and less easily completely removed. The delay in diagnosis is not to be attributed to the clinician but to the insignificance of the early signs and symptoms, and therefore one thorough radiographic examination is not sufficient and repeated examinations must be made if necessary. Apparent good health, a normal test-meal, no loss of weight, and no palpable tumour do not rule out cancer of the stomach. The general rule is that exploration should be carried out unless irremovable metastases can be demonstrated, and it is to be remembered that a large gastric tumour by no means contra-indicates operation. On exploration the uninvolved portion of the stomach above a large tumour may be rigid and thick, and this condition may wrongly lead the surgeon to decide against resection. Balfour considers that it is at times good practice to disregard involvement of the lymph nodes, since a patient may be cured even if all the involved glands are not removed. H. Hartmann, on the other hand, who reports 31 per cent. of three-year cures in 125 cases of gastrectomy, attributes his comparatively good results to his great care in removing those groups of glands most subject to invasion.[3] Balfour's last 200 cases of partial or total gastrectomy for cancer showed an operative mortality-rate of 5 per cent.

[1] Surg., Gyn., and Obst., Feb. 15th, 1932, p. 312.
[2] THE LANCET, 1928, ii., 438.

STAPHYLOCOCCAL INFECTIONS.

So many infections with staphylococci are of a comparatively trivial character that the capacity of these organisms for evil and the possibility of coping with them by serological methods have been rather overlooked. Staphylococcal septicæmia is not common but it is extremely fatal, the mortality being about 75 per cent., or even more. In the Bundaberg disaster 21 children were inoculated with a contaminated diphtheria toxin-antitoxin mixture and 12 of them died in a day or two from staphylococcal septicæmia. From this tragedy came Burnet's study of staphylococcal toxin and the preparation of an effective antitoxin, and his work has lately been re-examined and confirmed by Drs. H. J. Parish and Winifred H. M. Clark, at the Wellcome Laboratories at Beckenham.[4] The organism produces its toxin best in an atmosphere containing a good deal of CO_2, a cultural detail no doubt responsible for its toxigenic capacity having been overlooked for so long. The toxin is very poisonous to experimental animals; it is also conveniently hæmolytic so that it may be titrated in vitro as well as in vivo. Rabbits and horses may be immunised by a course of progressive doses either of the fresh toxin or of toxin which has been detoxicated with formalin. The sera thus prepared protect animals against fatal quantities of toxin, and they show some capacity to prolong the life, and sometimes prevent the death, of rabbits inoculated with live cultures; in this respect, however, there is obviously room for improvement. It seems likely that the leucocidin to which Drs. P. N. Panton and F. C. O. Valentine drew attention in our issue of March 5th (p. 506), and which is distinct from the hæmolytic toxin, needs neutralisation too, and this is no doubt within the possibilities of serum therapy. Bacteriologically the problem has a fruitful appearance, and it is to be hoped that adequate clinical trial will be made of the sera which are available, and of the active immunisation with toxoid which has been briefly explored at the London Hospital.

This renewed interest in staphylococci has also contributed useful information on the natural history

[3] Ibid., Feb. 20th, 1932, p. 419.
[4] Jour. Path. and Bact., March, 1932, p. 251.

of infection and resistance. About three-quarters of adults in Melbourne have in their serum a substantial amount of antitoxin.[5] Of 91 new-born infants, 76 (83 per cent.) were similarly endowed, but only 10 of 51 children (20 per cent.) from 4 months to 2 years; the grown-up condition is reached at about 7 years. The tale is evidently the same as with diphtheria. The changes and chances of communal life lead to infections and subinfections which produce an active immunity in the majority of people, with or without any memorable illness. The human placenta being what it is, these antibodies are transferred from mother to fœtus and carry the infant through its first few months. They then fade away and the child is left to develop its own individual immunity.

DIPHTHERIA PREVENTION IN LONDON.

THE progress of active immunisation to diphtheria in the British Isles and in New York is recorded by Dr. J. Graham Forbes in an interesting section[6] of the annual report of Sir Frederick Menzies, medical officer to the London County Council, on other sections of which we have already commented. In Metropolitan and Greater London up to the end of 1930 a total of 35,835 children at welfare centres or in residential institutions, and 7552 members of the nursing staffs of hospitals, chiefly fever hospitals, had either been inoculated or were known to be immune—a grand total of 43,387. Corresponding figures for 1928 show that the numbers tested have been more than doubled since then, and those immunised have increased over two and a half times. Can this achievement, having regard to the size of the population of London and the incidence of diphtheria, really be regarded as satisfactory? In New York City, according to Dr. Forbes, the determined efforts of the public health authorities to control diphtheria have been developed as a carefully coördinated scheme which included all concerned in the care of children, and as a result the numbers of children now immunised have been increased by over 380,000 in 1929 and 1930. In 1930 in New York City there were 3794 cases of diphtheria with 198 deaths. Of the fatal cases only four patients had previously received protective inoculation, in two of them within a month before attack. In the County of London in the same year there occurred 13,361 cases of diphtheria with 455 deaths, an increase over the previous year of 1708 cases and 104 deaths. In the outer ring of Greater London during the same year 4506 cases of diphtheria occurred with 190 deaths. The County of London in 1930 experienced approximately the same incidence of diphtheria, although the fatal cases were considerably fewer, as New York City, in 1927, before the intensive campaign commenced. In that year there were 13,507 cases of diphtheria with 717 deaths in New York. In Metropolitan London, Holborn Borough Council, on the advice of its medical officer, Dr. C. W. Hutt, provided facilities for testing and immunisation as far back as 1922, and was followed by 13 other metropolitan boroughs at various dates from 1926 onwards. Two of these boroughs, Finsbury and Poplar, have closed their immunisation centres owing to lack of demand. Finsbury had the highest diphtheria attack rate—namely, 4·63 per 1000—in Metropolitan London in 1930. Poplar's rate was 3·67 per 1000, the London mean attack rate being 3·03 per 1000. The total numbers of children dealt with at some of these metropolitan borough clinics since their opening are lamentably small. In certain districts of Greater London, notably Heston and Isleworth, Wood Green, and Ilford, the prospects are much more cheering. Dr. E. H. T. Nash and Dr. Guy Bousfield recently described[7] the details of an immunisation campaign in Heston and Isleworth and its results. The great success of this work may be ascribed to propaganda devised upon the assumption that the public to be influenced was intelligent, and to great frankness. Care was taken to make no extravagant promises of success. The response exceeded expectations, and Dr. Nash and his colleague are to be congratulated upon the results of an active policy well devised and carried out. In the absence of effective propaganda and coördination of effort by all concerned in the welfare of children, active immunisation against diphtheria can hardly be expected to make the progress which it obviously does make wherever its value is properly presented to the public.

[5] Bryce, L. M., and Burnet, F. M.: Ibid., p. 183.

[6] L.C.C. Ann. Rept., 1930, vol. iv., Part III. P. S. King and Son. No. 2877. 5s.

THE DIFFERENTIAL DIAGNOSIS OF PULMONARY TUBERCULOSIS.

THE complaint is often made that State interference in the treatment of tuberculosis has robbed the hospitals of the clinical material necessary for the instruction of students, and the general practitioner of interest in patients for whose care he has only a divided responsibility. The loss of the student and general practitioner has been the gain of the tuberculosis officer, whose special knowledge may compensate for the relative ignorance of his colleagues in districts where a close connexion is maintained between the practitioner's surgery and the officer's dispensary. The patient however must pass from the panel to the dispensary, and if the practitioner is not qualified to recognise the signs of incipient disease he may not come under the care of the tuberculosis officer till all hope of cure has vanished. Dr. Philip Ellman, realising the danger of the new situation, has written a book[8] designed to help the general practitioner who feels that he has lost touch with modern ideas on the subject of tuberculosis, and to bring his knowledge up to date. Dr. Ellman is concerned not with scientific theories, but with clinical observations, and his teaching is lucid and practical. He stresses the importance of radiology in the diagnosis of chest disease, and the numerous radiograms illustrating morbid conditions have been selected with discrimination and are well reproduced. The description of collapse therapy provides all that is necessary for an understanding of a valuable method of treatment, the carrying out of which must of necessity be left in the hands of those who have had special training. The chapter on the pulmonary diseases of childhood is less satisfactory. The practitioner to whom this book is addressed may be disappointed to find only 20 pages devoted to a subject that is beset with difficulties and which is of such vital importance to him. Though numerous references would be out of place in a work of this kind, a short bibliography would have added to the value of a book which is not a text-book dealing with the diagnosis, prognosis, and treatment of diseases of the chest as met with by the general practitioner, but a description of modern methods in the differential diagnosis of chronic pulmonary disease with special reference to pulmonary tuberculosis.

[7] Medical Officer, Jan. 16th, 1932, p. 25.

[8] Chest Disease in General Practice, with Special Reference to Pulmonary Tuberculosis. By Philip Ellman, M.D., M.R.C.P. London: H. K. Lewis and Co., Ltd. 1931. Pp. 266. 15s.

THE VALUE OF INTRACARDIAC INJECTIONS OF ADRENALIN.

THE efficacy of adrenalin injection into the heart in asphyxia has recently been disputed. Sir E. Sharpey-Schafer, F.R.S., and Mr. W. A. Bain describe[1] experiments on cats designed to test the value of such injections. A simple asphyxia was produced by occluding the trachea, the animals being anæsthetised with urethane. It was sometimes possible to revive the animal after the circulation and respiration had ceased by artificial respiration, provided the interval had not been too prolonged, though mere renewal of the air in the chest through a tracheal tube might have no effect. It was shown that where this latter procedure had failed, intracardiac injection of adrenalin quickly caused the heart to beat again. The blood pressure rose rapidly from zero to high levels, and then natural respiration was resumed. The recovery is attributed by the authors to the stimulating action of the adrenalin upon the arrested heart. Blood is pumped through the aerated lungs, and the asphyxiated bulbar centres are restored to their normal condition. The drug also acts upon the arterioles, and it is their contraction which causes the high blood pressures observed, and maintains the pressure at a sufficient level. These striking effects are most rapid if the injection is into the myocardium; if it is into one of the heart cavities they are produced more slowly, as the adrenalin then has to traverse the aortic and coronary systems—and if into the right heart the pulmonary system in addition—before it reaches the heart muscle. It was shown that in rare cases an adrenalin effect can be obtained with heart massage and artificial respiration without an actual injection. This appears to be due to the passage towards the heart of adrenalin-containing blood which has stagnated in the suprarenal veins in consequence of the failure of the circulation, and as a result of the intermittent pressure applied to the thorax and abdomen becomes driven to the heart. The work gives clear confirmation of the value of adrenalin as a stimulant to the heart and to the whole vascular system.

NAKED AND UNASHAMED.

A LETTER appears in last Saturday's *Times* pointing out that "active air-bathing" is extremely beneficial to the health and happiness of the indoor worker. The 22 signatories urge that the movement in its favour needs to be rescued from the ill-informed scorn and disrepute from which it has suffered, and that air-bathing should be raised to the level of other healthy recreations. There should be the same liberty with regard to clothing (away from the public highway) as is now allowed on the stage; "public authorities could well set aside grounds for air-bathing exercises; private people could well make similar use of their own grounds; light and air sports clubs could be founded, and so on."

On first consideration, the idea of a community of people deliberately practising nudity, especially with municipal encouragement, strikes the average person as somewhat ridiculous. Arguments commonly advanced are that nakedness is practised by savages, not by civilised races; that most people are ugly when stripped of their clothes; that nudity is indecent, and when practised between the sexes inevitably leads to promiscuity. But the discovery that the rays of the sun on the skin exert a beneficent effect on health has done something to undermine these prejudices. The thought of tuberculous children, now brown-skinned and active, tumbling about in Alpine snows is no longer disturbing, nor even the prospect of adults doing these things, as long as they are done for the sake of health and as long as the sexes are segregated. On the Baltic coasts public opinion is even more advanced, and nobody seems to be revolted by the spectacle of mixed bathing without garments of any kind. In England, however, most people would still regard such practices by civilised adults as barbarous and indecent. Not long ago Mr. Parmelee[1] attempted to expose the reasons for this condemnatory attitude. As is well known, anthropologists declare that it is suggestive dissimulation which is sexually exciting, not nudity, and what the anthropologist deduces from his studies, medical men and women learn from the more convincing process of personal experience. It is difficult to know to what extent perversions such as exhibitionism and scoptophilia are conditioned by the concealments of the body which are imposed by convention and by the mysteries and taboos it enjoins. The major and minor neuroses which appear in civilised communities are now being thought of more and more in terms of repression, and it is argued to-day that many of these repressions can be averted by educating children differently, particularly in their early years. It is quite possible that a change of attitude towards the body—one's own body and other people's—such as is implied in the dissemination of gymnosophic ideals, might, without the least harm to society, do much to dissipate superfluous and injurious repressions. Certainly the public exposure of the body, undefended by clothes and the dignities of rank which they indicate, is an urgent inducement to physical perfection. And although the signatories of the *Times* letter may long for official recognition inland, they are obviously fighting a winning battle along our coasts each summer.

Lord Dawson has been re-elected president of the Royal College of Physicians of London.

Sir Henry Dale, F.R.S., has been reappointed a member of the General Medical Council on the nomination of the Crown.

WE regret to announce the death, on Wednesday, of Dr. R. M. Bronte, well known for his work in connexion with medico-legal cases. He was pathologist to Harrow Hospital and the Samaritan Free Hospital for Women.

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[1] Proc. Roy. Soc. Edin., 1931–32, lii., 139.

[1] Nudity in Modern Life. By Maurice Parmelee. London: Noel Douglas. 1929. Pp. 303. 12*s*. 6*d*.

DOWN COUNTY MENTAL HOSPITAL: NEW PHYSIOTHERAPEUTIC DEPARTMENT.—The mental hospital at Downpatrick has always been one of the foremost in Ireland, and to its convenient block-system design, its separate reception hospitals, and its occupational therapy department has now been added an up-to-date physiotherapeutic block. The new building was opened on March 10th by the Governor of Northern Ireland and the Duchess of Abercorn. Its equipment includes carbon arc and mercury-vapour lamps, a Scholl pantostat, a vario-frequency diathermy machine, Vichy and Aix douche massage baths, needle and spray baths, Plombières douche, and full X ray outfit and dark room. The Governor switched on the dynamos and opened the new department with a gold key, and the Duchess then opened an extension of the occupational therapy department, where weaving, basket-making, rug-making, and art work of all kinds are to be provided for patients who are unsuited for work on the estate or in the workshops.

SPECIAL ARTICLES

PULMONARY TUBERCULOSIS IN CHILDHOOD.

BY F. J. BENTLEY, M.D. DURH., M.R.C.P. LOND., D.P.H.,

DIVISIONAL MEDICAL OFFICER, LONDON COUNTY COUNCIL.

ATTENTION has been focused of late on pulmonary tuberculosis in the child, expecially of school age, and in some quarters there is a feeling that study in this direction may go far to solve the problem of adult tuberculosis. In this connexion two questions spring to mind. Firstly, does indeed the tuberculous child grow up to help to fill our sanatoriums in adult life? Secondly, is the "A," or negative sputum, case in childhood of great importance, or can we afford to pay less attention to this and concentrate on the "B," or positive sputum cases?

The London County Council records show that out of the 4189 pulmonary and non-pulmonary patients coming under treatment for the *first time as adults* during the year 1930 only 25 were known to have received treatment under the Council's scheme for pulmonary tuberculosis during childhood. Of these 25, 11 were definitely positive sputum cases when treated as children, and all except one of the remainder showed undoubted involvement of lung tissue though tubercle bacilli were not demonstrated in the sputum. Looking at the question from another angle, it is significant that the after-histories of children with positive sputum are markedly different from those who do not cough up tubercle bacilli. Thus, taking the "A" cases who were discharged from treatment in 1924, we find 92·9 per cent. alive and well at the end of five years, whereas at the end of the same period only 15 per cent. of the "B" children were still surviving.

These figures are mentioned not by any means as exhaustive, but they do indicate that the disease that causes such concern in adult life occurs for all practical purposes de novo, and that clinical tuberculosis in the child is but little related to it. Also that "A" cases generally in childhood do very well, and that those indefinite cases that are, perhaps still too often, notified as suffering from pulmonary tuberculosis need cause little alarm.

The positive sputum cases in childhood are, on the contrary, very grave, and it is well to consider their occurrence and to ponder if more can be done to detect them earlier, or, better still, to prevent them.

Every year in London there are about 60 applications for residential treatment of such children below the age of 16, the great majority being new cases. These represent practically all the new cases coming on to the dispensary registers; during 1930 only three additional cases were known to the dispensaries for which residential treatment through the Council's tuberculosis scheme was not sought. The incidence in London as shown by the actual number of deaths recorded is as follows:—

Deaths from Pulmonary Tuberculosis. London, 1930.

Age-group.	Males.	Females.	Total.
0– 5	20	17	37
5–10	8	9	17
10–15	14	27	41
0–15	42	53	95

These figures may include a few negative sputum cases and some cases especially below the age of 5, in which the diagnosis may have been in doubt, but the majority must have been positive sputum cases.

An Investigation.

It will be seen that this condition is fortunately very rare. With the willing help of the metropolitan borough tuberculosis officers and the London County Council school medical service, it has been possible, however, to survey a group of 48 consecutive cases of pulmonary tuberculosis with positive sputum occurring before the age of 16. Certain factors have been analysed.

Sex.—There were 36 (75 per cent.) females and 12 (25 per cent.) males. This female preponderance is in accord with the excess of girl sufferers, chiefly above 12 years of age, which is constantly seen throughout the world.[1] My figures, however, indicate a more striking contrast than is actually the case as shown by the death-rates from tuberculosis for the whole of England and Wales.

It has been thought that the greater strain of puberty and adolescence in the female accounts for a good deal of this increased incidence, but whilst it has been popular to speak of this "strain" in many connexions, it has not been decisively demonstrated and possibly it is not important. The health officer of Calcutta in his report[2] for 1929 says that five girls die from tuberculosis between the ages of 10 and 20 for every boy; he insists that the most important factor in the ætiology of this disease in young girls in India is early marriage with its accompanying strain; but the predominance of the disease in females in England starts in the 5–10 year age-period. It may be that the closer contact that usually exists between female children and the other members of the family gives rise to greater possibilities of infection, or explanation may be found in the girls of this age already doing housework and generally not being so much in the open air as the boys.

Age.—As regards age at notification, one case in this series was 7 years of age, but, excluding this, the youngest was 10, whilst the average age at onset was 14; 64 per cent. of all the children were 14 or more. It will be seen, therefore, that half the cases are first diagnosed *after* leaving school.

Previous illnesses and mode of onset.—These children had mostly suffered (together with the majority of their school-fellows) from the specific infectious fevers, and had commonly had measles, whooping-cough, scarlet fever, bronchitis, &c. Cough and lassitude were the initial symptoms most frequently noted. It is interesting to learn from the school medical histories that some of these children were apparently healthy and robust before the onset of their symptoms. Some were apparently perfectly fit until the week or two before notification of the disease; two were keenly engaged in athletic pursuits, including swimming. It has been shown that there is no co-relation between tuberculous infection as determined by the tuberculin test and diminished body-weight[3]; recent work in America suggests that the influence of malnutrition generally has been overrated.[4] We must look therefore for the earlier cases of this disease just as much amongst those who are apparently healthy as amongst those who are debilitated.

Delay between onset of symptoms and diagnosis.—In over half the cases the period between onset of obvious symptoms and diagnosis was less than eight weeks. In only nine cases was there more than three months' delay. It is well known how loth many people are to consult a doctor when ill-health is first noticed. Generally we must consider that as soon as these

cases show obvious ill-health, they are diagnosed quickly. As regards the *actual stage* (L.C.C. classification) reached by the disease when these cases were notified, 6 (13 per cent.) were B1, 31 (64 per cent.) were B2, whilst 10 (21 per cent.) were B3 cases. One case did not show tubercle bacilli when first notified and treated, but these were found on subsequent treatment in 1929 and again in 1930. In about three-quarters of these cases therefore, in spite of the short period of "delay," the disease had become moderately or hopelessly advanced before being diagnosed.

Present Organisation for Detection of the Disease.

In the London County Council schools, in addition to the routine medical inspections and the "specials," particular attention is paid to the contacts of cases of tuberculosis that are referred by the tuberculosis officers. The school medical and tuberculosis dispensary services between them form a network through which the whole school population has to pass, and in the case of "suspected" or "suspicious" children the net is kept very tightly drawn. Yet, in spite of this, an occasional case slips through. In considering reasons for this, we must not forget that many of these children had already left school. The possible very rapid spread of disease is also a factor. It is probable that some children develop into advanced cases in the matter of a very few weeks.

Another explanation of this occasional "missing" of early cases may be found in the very fewness of such cases. Very many physicians have never seen a child with positive sputum. The disease in children is so rare that even a tuberculosis officer may go right through a year without coming across a new case. When a bird is seen on the treetops it is a hundred times more likely to be a sparrow than a nightingale, and on the hundredth occasion the nightingale is likely to be passed over as yet another sparrow; similarly, it is not to be wondered at that tuberculosis with positive sputum in childhood, from the very fact that it is such a rare bird, passes sometimes unrecognised—at least until the bird sings out.

Yet another reason why some early cases slip through is that physical examination for pulmonary tuberculosis is frequently misleading, and that in many cases it is only possible to arrive at a diagnosis after an X ray examination. Apparently healthy children, with no obvious abnormal physical signs, may show a considerable degree of involvement of the lung on a radiographic film. Dr. Burton Wood says,[5] "Without X ray control, physical examination is inadequate, for X rays have proved beyond all peradventure how slender may be the connexion between physical signs and pathological conditions."

Theoretically it is possible, then, that some of these cases could have been diagnosed earlier if, because of certain suspicions, physical or historical, the children had been subjected earlier to X ray examination. It is always easy, however, and seldom helpful, to be wise after the event, and it could be said with some truth that it is quite impracticable to radiograph every child who shows suspicious symptoms or history. Symptoms, when present, of early tuberculosis are, as we have seen, unfortunately not at all specific to that disease; excessive fatigue is frequently the only complaint, and this, of course, may point to very many other conditions besides tuberculosis. Clearly to radiograph every such child means radiographing almost all children. Short of this, is it possible to indicate any group of children who would, in the result, repay such special examination? Has this disease any specially increased incidence in any group of children to which we can point?

Contact with Infection.

Consideration of this brings us again to the question of "contacts." Attention has been drawn to the special care paid to children who are household contacts of notified cases of tuberculosis; the scheme whereby such contacts may be actually "boarded-out" with foster-parents is familiar; why such schemes and precautions? To some extent because the medical profession generally feel that children living in close contact with advanced cases of tuberculosis are liable to infection and disease, to some extent because the lay public is quite sure that consumption is "catching." There is much evidence, however, indicating that whilst tuberculosis is a bacterial disease, infection, when it occurs, does not determine the onset of the illness; the germ is widespread, yet comparatively few develop the disease; the result of examination of all contacts of all notified cases of tuberculosis is very disappointing, that is to say, very few new cases of the disease are found amongst those people who should be most subjected to infection.

Prof. Saugman was unequivocal about this problem. He stated: "It is not dangerous for healthy adults to be coughed at by patients suffering from pulmonary or laryngeal tuberculosis."[6] This may be true (though I, personally, prefer not to risk it!), but can we say the same of children? Can infection be unimportant in the adult and yet important in the child? It is so in some other diseases. Adults may mix, with but little risk of infection, with cases of measles and chicken-pox, but children will find these diseases readily transmitted to them. It may be said that adults have probably had chicken-pox or measles and thereby have gained an immunity, whilst the child is yet virgin soil. In many ways is not tuberculosis analogous?

Pathological investigations and tuberculin reactions have repeatedly shown that few humans reach adult life without becoming infected with the tubercle bacillus. In children, however, the factors are entirely different; practically speaking, all children are born without tubercle bacilli in their bodies—their resistance has not yet been tested. They may be exposed early, and succumb to the first breath of infection, as, for example, an infant who, from contact with an open case of tuberculosis, gets generalised tuberculosis and dies, frequently with meningitis; they may not be exposed to any definite source of infection and may become tuberculised very gradually as they grow up without any untoward effects; or they may be kept, in the minority of cases, entirely free from tubercle bacilli. All variations are seen between early and massive tuberculisation followed by death, and gradual tuberculisation without symptoms and with subsequent resistance.

The late Sir William Osler drew the parallel between infection in tuberculosis and the parable of the sower, which illustrates effectively the importance of the individual resistance and the importance of the virulence of the bacilli. Always there are the two determining features, the soil and the seed; but I venture to suggest that whilst in adults the soil is paramount, the seed already having been sown, in children we must consider, much more, the seed. In other words, whilst in adults we may afford somewhat to neglect infection as determining the onset of tuberculosis, in children we must pay it no little respect. Childhood is the time of preparation of the soil, and during that time we must beware of the seeds that are sown.

Of these children under survey, 42 per cent. belonged to families that had already shown at least one previous case of tuberculosis. This information about contacts was not considered sufficiently accurate, and special inquiry has been carried out to ascertain whether the contact in these cases has been with a non-pulmonary case or with a pulmonary case and, if the latter, whether the first case in the family was coughing up tubercle bacilli or not and whether living or dead, and 73 further cases have been investigated in this particular direction. The additional cases have occurred consecutively with each other and with the original 48. No selection has been made beyond the fact that all the children were sputum-positive cases of tuberculosis.

Analysis of these 121 cases shows that in 53 (44 per cent.) there was a history of a previous case of tuberculosis (pulmonary or non-pulmonary) in the household, but I will confine myself to a consideration of contact only with definite cases of pulmonary disease, alive and known to the dispensaries and presumably notified, and with cases that had died from this disease within the preceding five years. But before doing so I want to indicate approximately in how many school-children one might expect "normally" to find a history in the family of either notified living pulmonary tuberculosis or death from the disease within five years.

I wish to make it clear at this point that an accurate statistical survey is not being attempted here, and that such figures as I use now are put forward only to show the general trend of the argument.

At the end of 1929 in London there were 32,117 cases of pulmonary tuberculosis on the registers of the metropolitan boroughs. The total population was 4,417,900. There was therefore, one living case of notified pulmonary tuberculosis for every 137 people. From the 1921 census it is seen that out of a total London population of 4,484,532 there were 1,120,897 private families. Taking either a borough in which the children are all elementary school-children, such as Bermondsey (total population 119,452; total private families 28,610) or a densely populated borough such as Stepney (total population 249,657; total private families 55,832), and after taking into consideration the childless marriages and the single people living alone we cannot average more than five persons per family; it may be assumed, therefore, that throughout London there will be found one notified case of pulmonary tuberculosis in $\frac{137}{5}$ families; or, to put the matter another way, if we search the families of any 27 unselected elementary school-children, we may expect to find one living case only of notified pulmonary tuberculosis.

To include the possibility of history of death from pulmonary tuberculosis, it becomes necessary to add to the total number of living cases with which contact was possible the numbers of those who died from this disease during the years in which such history is to be taken into consideration. If we consider a family history of death from pulmonary tuberculosis within five years to be important, we must add 20,000 (five years × 4000 deaths per year) to the number of possibilities. The London population then would have 52,000 (32,000 + 20,000) "chances" of contact with a case of pulmonary tuberculosis, either alive and notified, or dead within the past five years—i.e., one in 85 $\left(\frac{4,417,900}{52,000}\right)$.

Thus one might expect to search the families of 17 $\left(\frac{85}{5}\right)$ school-children before finding either a case of notified pulmonary tuberculosis or history of a death from this condition in the preceding five years.

Converting these "normals" into percentages and comparing them with the incidence of previous pulmonary tuberculosis amongst the families of my 121 sputum-positive children, we find that, whilst 3·7 per cent. of normal school-children have in the family a living notified case of pulmonary tuberculosis, 14 per cent. of sputum-positive children show a similar family history; and whilst 5·9 per cent. of normal children have a case of notified pulmonary tuberculosis alive in the family or one dead within the preceding five years, 28·9 per cent. of sputum-positive children show similar contact with the disease. These contrasts are even more marked if the actual numbers of cases in the families of the affected children are taken into account, as in several families there had been more than one previous case of pulmonary tuberculosis either alive or recently dead.

It will be seen therefore that children from tuberculous households are specially liable to develop sputum-positive pulmonary tuberculosis.

Special Investigation of Contacts.

It becomes necessary now to consider what further can be done by specially investigating all such child contacts. It would mean a considerable work; would it be worth while?

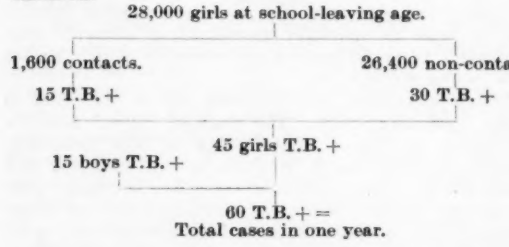
Before answering this question let us see what is being done elsewhere. The work of Opie [7] and his colleagues in the United States is now generally familiar to tuberculosis workers in this country, and elsewhere in America similar intensive investigations by means of skin-testing and radiography on large groups of school-children have been carried out, as in Massachusetts [8] and in Chautauqua County, New York.[9] The Americans have not confined themselves to investigating contacts, but have combed through entire school populations, and they appear to think the results justify such a course, a large number of hitherto unsuspected children being found to be suffering from pulmonary tuberculosis either active or "latent."

It would appear therefore that more is being done in some parts of America with the help of tuberculin testing and radiography to find earlier cases of tuberculosis in children than we are doing in London, and it has been suggested by certain authorities that similar work should be started in this country.[10 11] But the problem of tuberculous children in the States is very different from our task here. One point is fundamental and must not be lost sight of. Our children largely leave school at age 14, when there is very little serious tuberculosis to be found; above that age the incidence curve climbs steadily and steeply into the twenties; every year of adolescence provides an increasing number of cases. American "children" stop at school commonly until 16 years of age, and many of the high-school pupils are 17 and 18. At these latter ages tuberculosis becomes comparatively common, and the Americans find it. They find, in addition, many cases of so-called "latent" tuberculosis of uncertain significance. There is a real danger in labelling too many children as "suffering from" tuberculosis. We must not forget that there is a process of tuberculisation through which most children in our present civilisation have to pass.

How many real cases of pulmonary tuberculosis could we expect to find by investigating school-children in the "American" fashion? No group of school-children would provide more fruitful material than girls at school-leaving age who were contacts of either a living case of tuberculosis or in whose family there had been a recent death from the disease. I have said that one child out of 17 could be expected to fall into this group; out of 28,000 girls (school leavers in one year) of 14 years of age, a group of about 1600 "contacts" would be chosen. Now, whether we find them early or late, there are about 60 positive sputum children every year. Let us say that 45 of these are girls; let us say that 15 of these will be contacts; let us assume that all the sputum-positive children to be found

(including those who would normally be diagnosed at the later ages of 15 and 16) can be found in this age-group of 14, then we will "discover" 15 cases in 1600 children. As the assumption of finding all sufferers for that year at age 14 could, of course, not hold good, a much smaller number of children with disease would be found, and some of these would be discovered in the ordinary way by the methods and organisations at present at our disposal. Also, and this is very important, two-thirds of the problem —i.e., non-contacts—would remain untouched.

It is interesting to show the possibilities as below, for it also demonstrates the greater risk to contact children.



It is, of course, realised that a certain additional number of cases of pulmonary tuberculosis not showing tubercle bacilli would also be disclosed by such an investigation. Nevertheless, the number of sufferers discovered would be small. Investigate as we will we cannot find cases that do not exist.

Such investigation, therefore, hardly appears to be within the scope of the antituberculosis scheme of local authorities. Work of this description, however, should prove a fruitful source of research, as systematic examination of a group of specially susceptible children as indicated could not fail to reveal factors of importance. Children would be found apparently normal at the time of investigation who would develop definite sputum-positive disease subsequently; working backwards, then, to the original findings should, in certain cases, be the means of shedding light on equivocal factors and increasing knowledge about the earliest manifestations of the disease.

Summary.

(1) 48 consecutive sputum-positive cases of tuberculosis in children have been investigated with regard to, inter alia, the previous history and mode of onset, the period of delay between onset and notification, the exact stage reached by the disease at the time of notification, age and sex.

(2) 121 consecutive sputum-positive cases of tuberculosis in children have been investigated especially to ascertain the importance or otherwise of contact with other sufferers in the household. (These cases include the previous 48 children.)

(3) The present organisation for dealing with the problems concerned has been surveyed, and modern methods in operation in some parts of America have been discussed.

Conclusions.

A. Negative Sputum Cases.—(1) The great majority of negative sputum or "A" cases of pulmonary tuberculosis in childhood are alive and well after five years. (2) These cases only exceptionally develop clinical tuberculosis in adult life.

B. Positive Sputum Cases.—(3) The positive sputum cases of the disease in childhood are very rare. (4) When tubercle bacilli appear in the sputum of a child the outlook is grave. (5) Girls are affected much more frequently than boys. Whilst the appearance of positive sputum disease in any child under 16 years of age is rare, the condition below the age of 10 is a medical curiosity. The incidence rises with advancing adolescence, the curve ascending to the young adult peak in the twenties. (6) Children living in contact with open cases of tuberculosis in the household are in greater danger of developing the disease than children in healthy homes. (7) Children show a high degree of resistance to tuberculosis, as even child contacts, though they may show "infection" by tuberculin tests, seldom become affected by the disease. (8) When symptoms become obvious the disease is usually detected quickly. (9) The disease may be present for some considerable time, occasionally in apparently robustly healthy children, before symptoms proclaim themselves. (10) Even repeated physical examinations during this latent period fail frequently to demonstrate the trouble whilst it might be yet curable. (11) Radiography should succeed in some cases where ordinary methods of examination fail, and it should be employed in all cases where the suspicion of tuberculosis has been raised, before arriving at a negative diagnosis. (12) Suspicious symptoms, such as cough or lassitude, in a contact, especially in the older girls, should be the signal for an immediate and searching investigation. (13) Intensive investigation by means of systematic skin-testing and radiography on large groups of children on the American lines cannot be advocated generally in England. In a specially selected group of contact children, however, such work would prove a valuable research.

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THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

THE following appointments are notified: Surg. Lts. J. A. Browne to *Gnat*; and A. E. Flannery to *Tarantula*.

ROYAL ARMY MEDICAL CORPS.

Maj. J. A. Whitaker, Dental Surg., relinquishes his temp. commn.

H. C. M. Walton to be Lt. (on prob.) and is secd. under the provisions of Art. 213, Royal Warrant for Pay and Promotion, 1931.

ARMY RESERVE OF OFFICERS.

Lt. W. F. Roper resigns his commn. and retains the rank of Lt.

TERRITORIAL ARMY.

Col. H. H. C. Dent, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capts. W. Barclay and J. F. O'Grady to be Majs.

Lt. E. C. Woodhead to be Capt.

E. Walsh to be Lt.

RESERVE OF AIR FORCE OFFICERS.

The undermentioned Flight Lts. relinquish their commissions on completion of service: B. Pollard and G. J. Griffiths.

OPENING OF MANSON HOUSE.

THE NEW HOME OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.

MANSON House, the new home of the Royal Society of Tropical Medicine and Hygiene, was opened by H.R.H. the PRINCE OF WALES on March 17th.

Dr. G. CARMICHAEL LOW, President of the Society, in welcoming the Prince, welcomed also Sir Austen Chamberlain, who had helped the original appeal for funds in memory of the Father of Tropical Medicine, and so made possible the acquisition of Manson House. The Society, he said, had been founded in 1907 in order to centralise the various tropical medical activities both at home and abroad, and to give medical men who had worked in the tropics a place where they could meet and discuss their problems. The Society now had over 1700 Fellows, and more than 100 branches, all over the world. Its membership included representatives of medical, veterinary, and other sciences, and of practically every nationality, and by 1930 the Society had reached such dimensions that it was decided to establish it in a home of its own. Contributions to this end had been received from all parts of the world, and had made it possible to purchase 26, Portland-place, and to build in its "backyard" the beautiful hall in which the meeting took place. A further sum of £15,000 was, however, needed to meet the obligations in full.

The new hall of Manson House in Portland Place.

The PRINCE OF WALES, in declaring the house open, said that he had always been very interested in tropical medicine. This was not the first function he had performed for the Society, but he felt more fitted to perform it than he had on the last occasion, having since then been stricken with malaria. Some of his more hardened friends in Kenya were not displeased that he had had malaria, since his convalescence was speedy and the reports would be a good advertisement for the colony. Many of our possessions were in tropical regions, and the chief obstacle to our work in them was tropical disease, which was thus of the first importance. Much progress had already been made, largely owing to the effort of great pioneers who had studied tropical diseases on the spot, and had saved hundreds of thousands of lives. The pioneer name that came to their minds that afternoon was of course that of Patrick Manson, after whom the house had been named and whose widow was present. He was in fact the father of modern tropical medicine, and the practical effects of his genius were well illustrated in the completion of the Panama Canal. With the help of that far-seeing statesman, Mr. Joseph Chamberlain, Patrick Manson had founded the School of Tropical Medicine in London, and had been the first President of this Society. Conditions in tropical lands changed rapidly, and one of the most striking changes had been the improvement in communications. These would—unless precautions were taken—tend to increase the spread of disease, but would also advance the ability to control that disease. In this house those who had made discoveries and those who had gained experience would be able to pool their knowledge for the help of future workers.

Sir AUSTEN CHAMBERLAIN proposed a vote of thanks to the Prince for his continuous interest in the study and relief of tropical disease. He very well remembered the extent to which his father had been troubled by the toll of life taken by tropical disease. When the post of medical adviser to the Colonial Office fell vacant Joseph Chamberlain had sought the man in London who knew most about tropical disease, and his inquiries had soon led him to Sir Patrick Manson. Now London had facilities for the study of tropical disease which were unrivalled throughout the world. The death-rate in the tropics at the time Joseph Chamberlain went to the Colonial Office—1896—had been 100 per 1000 per annum; now it was between 8 and 9 per 1000. No work more beneficent to mankind had ever been done than that of Sir Patrick Manson.

Col. W. P. MACARTHUR, seconding the vote of thanks, mentioned a contribution to Manson House from a cricket club in Rhodesia, the members of which had realised that but for Manson they would not have been playing cricket under conditions almost as healthy as those in England.

The Prince of Wales then went on a tour of the building, an Adam house very pleasantly decorated in green, with oak panelling. On the ground floor is a comfortable members' lounge and a library which will, it is hoped, come to hold on its shelves a complete reference library of tropical medicine. There are also well-fitted cloakrooms, dressing-rooms, and offices. The upper part of the house and the garages are sublet, and provide a useful source of revenue. The well-proportioned hall (illustrated above) is panelled in cream and fitted with rows of brown stalls.

MEDICINE AND THE LAW.

Noise Nuisance: Dog Kennels and Nursing Home.

THOUGH the nuisance of noise may be specially serious for them, patients for whom quiet is essential have no stronger legal rights in this respect than any other citizen. The law takes note of noise under various statutes. The Chimney Sweepers Act of 1894 forbids knocking at house doors or ringing bells; the Road Traffic Act allows regulations to be made with respect to "excessive noise owing to the design or condition of the vehicle or the loading thereof," though not much use has been made of the power; and local Acts have for a long time forbidden the disturbance of the Sabbath peace by the crying of newspapers. Local Acts have latterly taken other steps against the noise nuisance—for instance, against noisy speed-boats at Brighton, against noisy campers in Surrey, against noisy salesmen in the market at Taunton, and to enforce the fitting of silencers to stationary internal combustion engines in several towns. The general clause against noise, for which Edinburgh and other cities furnished a precedent in local legislation, has in the last few years attacked "excessive or unreasonable or unnecessary noise" where it is "injurious or dangerous to health," and is "capable of being prevented or mitigated, having due regard to all the circumstances of the case." We may hope that such a clause will become universal.

Meanwhile the ordinary law gives some protection, as is shown by a recent case before Mr. Justice Clauson. Dr. E. L. Williams in 1926 bought 4¼ acres of land in the Harrow Weald for a nursing home, choosing the locality because it was quiet. In 1930 Mrs. Wagner bought adjoining premises for use as dog kennels; there was accommodation for 50 dogs in the space of 1¼ acres; the average number of dogs present was about 40 in the summer and 20 in the winter; two rooms in the house, one 18 ft. by 12 ft., the other 12 ft. by 8 ft., were used for as many as 30 dogs. Dr. Williams found that the noise of barking and whimpering seriously affected the use and enjoyment of his own premises and depreciated their value. He therefore claimed an injunction to restrain Mrs. Wagner from keeping dogs so as to occasion a nuisance to his household. Mr. Justice Clauson accepted the evidence of the plaintiff and his witnesses, and said it was clear that Dr. Williams was suffering inconvenience amounting to a legal nuisance; his neighbour's evidence had established the fact, though there was of course evidence to the contrary on behalf of the defendant. Bearing in mind the large accommodation for the dogs and the average number of dogs in winter and summer, said the judge, one could not be astonished by the evidence of the plaintiff. It had been said, he continued, that the objection to the use of the kennels was fanciful. On the facts proved there was undoubtedly an inconvenience which interfered with ordinary physical comfort and to which "any person of sober and simple notions" could object. He granted the injunction and awarded costs against Mrs. Wagner.

All these cases are necessarily dependent upon their own facts. The same remedy has previously been granted in respect of nuisance from printing machines, building operations at night, newspaper carts at night, clattering milk cans in the early morning, a rifle gallery and roundabouts belonging to a circus, a stable too near a dwelling-house, and musical practice. The piano next door indeed is a fruitful source of annoyance. Persons affected should realise that the enforcement of their reasonable rights depends upon the strength and volume of their evidence; they should keep a diary and carefully note the times and durations of the obnoxious sound, though they must not expect to be able to restrain all musical manifestation in their neighbourhood. The noise inseparable from an aerodrome and the vibrating hum of aircraft is another matter of which plaintiffs have complained. But it must be reiterated that in law a nursing home has no right to a higher standard of quiet in its vicinity than any other dwelling-house.

Alleged Professional Negligence: Another Claim Settled.

On three days and a half a serious allegation of negligence and want of skill on the part of two medical practitioners has been examined before Mr. Justice Horridge and a special jury, the plaintiff being a panel patient. It was deemed desirable for the two defendant doctors to be separately represented; thus it happened that, in all, six barristers were engaged in the case, three of them being King's Counsel. After the luncheon interval on the fourth day of the hearing, after the first defendant had given his evidence and been cross-examined, and after Sir Charlton Briscoe had given evidence on this defendant's behalf, counsel for the plaintiff announced that a settlement had been reached. Mr. Croom-Johnson, K.C., for the plaintiff, stated that his client, having heard the defendant doctor's evidence and his statement as to the care which the doctor desired to give to the plaintiff in his illness, accepted the doctor's explanation and withdrew the charges of negligence. As regards the second of the two doctors, the case having been settled before he had had an opportunity of giving evidence, "it would be unfair to drawn any inference whatever" of negligence against him. Mr. Roland Oliver, K.C., who appeared for the doctor who had already given evidence, observed that, as the case had achieved a great deal of notoriety, he felt he ought to say that his client was not a party to payment of anything either by way of damages or costs.

As the allegation was withdrawn it is unnecessary to elaborate the suggestions on which the charge of negligence was based. Briefly, the plaintiff, a man of about 65, employed as a gardener, said he suffered from an ingrowing toe-nail which caused pain and inflammation. He said that the two defendant doctors (who were in partnership) treated him for gout upon a careless diagnosis after insufficient examination. In consequence, he alleged, he had to undergo two or three operations; some five incisions were made in order to relieve him; he was laid up for more than a year; and he was now lame. Sir Charlton Briscoe said that, after hearing the whole of the defendant doctor's account of the plaintiff's symptoms, he saw nothing medically wrong in the diagnosis or treatment if the account were correct. The practitioner would be right in looking for a wound or a scratch on the foot; in the absence of a wound or scratch, a diagnosis of gout would be justified. The condition of the plaintiff's foot could have been due to some internal cause such as septic organisms passing through the blood. He regarded the ingrowing toe-nail as the possible cause of the trouble, but the inflammation caused by this might have subsided, leaving no visible trace of where the poison entered. Unless the doctor was told about the toe-nail, or the toe was inflamed, there was no reason why he should

have discovered it. This and similar evidence seems to have disposed the plaintiff and his advisers to settle the claim and to withdraw the allegations.

It would not be difficult to make a rough guess at the total cost of these abortive proceedings—the fees of six counsel for 3½ days and the charges of three sets of solicitors. It is doubtful whether the plaintiff is any better off as the result of bringing his claim. It is certain that the defendants have not gained anything. Even when allegations of professional negligence have happily been entirely withdrawn, the experience is not one which a professional man covets. One can only repeat again the fact that this kind of litigation is unfortunately a risk of medical practice, that the most resolute defence must necessarily be made, that the making of the defence is a matter involving considerable expense and requiring skilled advice, and that those practitioners are to be congratulated who have obtained financial indemnity and expert help by virtue of their membership of a medical defence society.

AMERICAN METHODS OF MILK CONTROL.

(BY A SPECIAL CORRESPONDENT.)

In most matters of public health we in this country are proud to think that we have led the world, but however true that may have been in the past, it cannot be gainsaid that in some departments of public health administration America is at the present time well abreast of us, and in milk control there are those who would say that she has taken our place in the van. An account of American methods of milk control may be of interest, particularly in view of the recent decision of the Manchester City Council to seek powers to apply compulsory pasteurisation to the local milk-supply, although, owing to the wide differences between American and British administrative conditions, it by no means follows that methods that have been successful in the United States would be practicable in this country.

MILK DRINKING IN AMERICA.

Compared with Europe, America is a country of milk-drinkers. A foreign observer is surprised to note the number of adults who drink milk as a beverage. This may partly be due to prohibition, but possibly should chiefly be attributed to a growing appreciation of the advantages of milk as a cheap and nutritious food. These advantages are brought prominently before the public by an active propaganda carried on by progressive health departments and voluntary health organisations. Wide publicity is given to comparisons of the food value of milk and other articles of diet, such as the calculation of Prof. Rosenau, of Harvard, that a quart of milk is about equal, as a source of energy, to any of the following:—

2 lb. of salt cod-fish, 3 lb. of fresh cod-fish, 5 lb. turnips, 4/5 lb. of chicken, 6 lb. of squash, 9¼ oranges, ¾ lb. of lean beef, 2 lb. of potatoes, 6 lb. of spinach, 7 lb. of lettuce, 4 lb. of cabbage, 8 eggs, 4½ lb. of lobster.

The public is instructed not only in the food value of milk, but also in the dangers of milk-borne disease. Accounts of outbreaks of disease spread by milk afford strong arguments in favour of milk control, and especially of compulsory pasteurisation, which is now widely adopted in America.

SOME DIFFICULTIES OF CONTROL.

One of the chief difficulties in the way of securing a satisfactory milk-supply is that although the majority of milk consumers are city-dwellers, the milk they consume is produced in rural districts outside the administrative area controlled by the city health authorities—some of New York's milk comes from Canada. Water-supply presents similar difficulties, which the modern city overcomes by purchasing a gathering ground in the country, building a reservoir, and conveying the water to the city through miles of pipes. Milk-supply is a more complicated matter, but the American city attempts to deal with it similarly by a projection of its controlling functions into outside areas.

In matters of city government an American city has wide powers: it is practically an independent legislative authority. Without reference to any other authority it can adopt a public health code giving it powers that a British municipality could obtain only, if at all, by a local Act of Parliament. This local independence has been of considerable value from a health point of view, since it has enabled the more progressive communities to enact laws, and formulate appropriate administrative measures, which have set the pace in the movement for public health reform.

THE MILK ORDINANCE.

In milk control the Federal Government has no administrative authority in the areas of the various States of the Union. Nevertheless it exercises a real and effective influence. It is an intelligence centre for the collection and distribution of information on milk hygiene technique, and it has issued an important body of model milk regulations—the United States Public Health Service Milk Ordinance—which has had considerable influence in guiding local legislation.

The Milk Ordinance has been adopted by 450 municipalities, and similar and even more stringent regulations are in operation in many other cities. It may be taken as indicating the provisions that are now in operation to safeguard the milk-supply of the more progressive cities in America. The Ordinance is based on two main principles:—

(1) That all producers and distributors of milk sold within a city must hold a permit from the city health authority; (2) that all such milk must be graded and the container labelled with the label of the appropriate grade.

The Ordinance prescribes the conditions under which permits may be granted and the milk graded. The permit system enables the city health authority to inspect all the dairy farms and milk plants whose milk is intended for consumption in the city. The farmer in another area may refuse to admit the city inspectors, but if he does his permit may be revoked. His milk then cannot be sold in the city, and that market is closed to him. In this way the milk control exercised by a city authority may extend far beyond the city boundaries.

The grading system is found to have many advantages. It enables the health authorities to standardise the various qualities of milk supplied, and brings into operation an influence impelling producers and distributors on commercial grounds to bring their milk within the higher grades. It also, as will be seen later, provides the authorities with an effective method of dealing with defaulters.

MILK GRADES.

The Milk Ordinance defines eight grades of milk, which are briefly indicated below :—

Certified milk must conform with the current requirements of the American Association of Medical Milk Commissions, and is produced under the supervision of the Medical Milk Commission of the County Medical Society, and of the State Board of Health, or of the City and County Health Officer. It is raw milk produced under stringent sanitary conditions, is sold at a high price, and forms but a very small proportion of the total milk-supply.

Grade "A" raw milk must have an average bacterial count not exceeding 50,000 per c.cm. It must be drawn from cows that have passed a veterinary examination, with tuberculin testing, be cooled within one hour after milking to 50° F. or less, and kept at that temperature until delivery, and be supplied in bottles. It must also be produced under certain hygienic conditions, which are defined in detail.

Grade "B" raw milk must have an average bacterial count not exceeding 200,000 per c.cm. ; otherwise it must conform with all the conditions that are required for grade "A" raw milk, except that the cooling temperature standard is 70° F.

Grade "C" raw milk may have an average bacterial count not exceeding 1,000,000 per c.cm. ; otherwise it must conform with the standards that apply to grade "B" raw milk.

Grade "D" raw milk must, like all milk, contain not less than 3¼ per cent. of milk fat, and 8½ per cent. of solids not fat, but otherwise it is not standardised and must be labelled "cooking only."

Grade "A" pasteurised milk is grade "A" or grade "B" raw milk that has been pasteurised, cooled, and bottled in a milk plant complying with certain hygienic conditions. Its bacterial count must not at any time between pasteurisation and delivery exceed 50,000 per c.cm.

Grade "B" pasteurised milk is grade "C" raw milk pasteurised under all the conditions that apply to grade "A" pasteurised milk.

Grade "C" pasteurised milk is pasteurised milk that does not conform with the requirements of grade "B" pasteurised milk, and it must be labelled "cooking only."

Although the Milk Ordinance provides for no less than eight grades of milk, in practice a smaller number is generally adopted. In many American cities no raw milk, except certified milk, is allowed to be supplied, and by the adoption of compulsory pasteurisation the number of grades has been reduced to three : certified milk, grade "A" pasteurised, and grade "B" pasteurised.

COMPULSORY PASTEURISATION.

The movement for compulsory pasteurisation has made great progress in America in recent years, and is still gaining ground. The movement owes much of its success to the late Mr. Nathan Straus, the well-known philanthropist, who fortunately lived to see the wide acceptance of his views on milk hygiene. Mr. Straus nearly 40 years ago established milk depôts in New York for the supply of pasteurised milk, modified for infant feeding, and was untiring in his advocacy of the compulsory pasteurisation of the general milk-supply. Pasteurisation is now compulsory in New York and many other cities in the United States.

Pasteurisation is defined in the Milk Ordinance as "the process of heating every particle of milk or milk products to a temperature of not less than 142° F., and holding at such temperature for not less than 30 minutes in a pasteurisation apparatus approved by the health officer." In practice it is necessary to make allowance for a margin of error in the thermometers used for recording the temperature of the milk in the container, and also for a deviation between the hottest and coldest particles of milk in the container during the process. A combined "tolerance" of 1½° F. is permitted, so that the recorded temperature required for pasteurisation is 143½° F. It is recommended that approval should not be given to any pasteurising plant with a combined tolerance exceeding 1½° F.

PUBLICITY FOR PASTEURISATION.

The 1931 edition of the Milk Ordinance is preceded by an account of the "Public Health Service Milk Sanitation Program," by Mr. Leslie C. Frank, the sanitary engineer in charge of the Federal Office of Milk Investigation. This document contains much practical guidance, based on extensive experience, for city authorities contemplating the adoption of the Ordinance. Compulsory pasteurisation is strongly recommended, and health officers are given suggestions for overcoming possible objections from the public to pasteurisation, one of which is that the process imparts an unpleasant flavour to the milk. To meet this objection, a "guessing contest" is suggested :—

"For example, one of the local pasteurisation plants may furnish both raw and pasteurised milk in quart bottles to the Rotary and other civic luncheons, the bottles being marked with distinguishing marks unknown to the drinkers. Each member should be provided with six glasses, placed in a row in front of him. A small portion of pasteurised milk should be placed in three of the glasses and a small portion of raw milk in the other three in an order unknown to anyone but the health officer. The members should not be told how many glasses contain pasteurised milk. Then each member should be asked to tell by tasting which of the six glasses contain pasteurised milk. (It is fundamentally important that the raw milk and pasteurised milk be identically the same milk, except for the fact of pasteurisation. This condition is accomplished best by obtaining the raw milk directly from the pasteuriser just prior to the pasteurisation process, after thorough mixing, and then obtaining the pasteurised milk from the same batch of milk.)

"Each guest should be provided with a small card. The glasses should be considered as being numbered from left to right, and each guest should be asked to write on the card the numbers representing the glasses containing pasteurised milk. Then someone from the speaker's table should announce the true content of each of the six glasses, and all the members who guess correctly may be awarded a prize of some sort."

After such a guessing contest has been tried upon at least 100 persons in the city, the results may, it is suggested, be published in the newspapers as evidence of the fact that proper pasteurisation does not affect the flavour of milk.

DEALING WITH DEFAULTERS.

The Milk Ordinance provides two methods for dealing with defaulting dairymen otherwise than by means of court prosecutions for failure to observe the standards of milk hygiene prescribed : one is the withdrawal of the permit, the other de-grading the milk of the defaulter. By the first method the permit may be withdrawn and the offender prosecuted if he continues to sell his milk without a permit. But this method is, in practice, applicable only in cases of serious default, for otherwise the courts are reluctant to convict, or at all events to impose an adequate penalty. A much more effective method is to de-grade the defaulter's milk and require him to affix a lower grade label to his containers. If he then persists in selling his milk under the higher grade label he can be prosecuted for false labelling, an offence which American courts view with great disfavour. In practice it is seldom necessary to prosecute in such a case, for the offender knows that he will receive short shrift when the court are satisfied that he has not been refused permission to sell his milk, but merely required to label it according to grade. He therefore seldom allows the case to go into court, but promptly complies with the requirements and gets back into his grade as soon as he can.

OBITUARY

SIR WILLIAM SMITH, M.D. Aberd., D.Sc. Edin.,

PRINCIPAL OF THE ROYAL INSTITUTE OF PUBLIC HEALTH.

WE regret to announce the death of Sir William Smith, principal of the Royal Institute of Public Health, which occurred on March 17th at his house in London in the eighty-third year of his age.

William Robert Smith, the eldest son of Captain T. R. Smith, of the Merchant Service, was born in 1850 in circumstances which compelled him to rely mainly upon his own endeavours for making a career.

SIR WILLIAM SMITH.

At the age of 15 he began to earn his own living as an assistant to a chemist, and he so well occupied his spare time as to be able to enter the medical school at St. Bartholomew's Hospital, and later to complete his medical course at Edinburgh, where he obtained the double qualification of the Colleges in 1871. He became house surgeon at the Hants County Hospital, and while there graduated in medicine at Aberdeen, and shortly afterwards received the appointment of medical officer to the old School Board for London, this being a new post. From this time onward he devoted himself with extraordinary energy to the general cause of public health, and to him undoubtedly belongs the credit of having been the first man holding any public position to insist upon the necessity of an educational organisation, to ensure that medical men holding official positions in public health should possess a special diploma. He took an early opportunity of possessing such a diploma himself, securing the D.P.H. Camb. in 1881, about which date he entered as a student at the Middle Temple. On being called to the Bar he obtained an appointment as lecturer in forensic medicine at King's College, London, while he also was chosen as medical officer of health for Woolwich. He found time also to edit the seventh edition of Guy and Ferrier's standard text-book on forensic medicine.

In 1886 he founded the British (now Royal) Institute of Public Health, and for the following 46 years devoted his life to the progress of public health work as represented by the Institute. Seeing that from the beginning such a movement must rely upon public coöperation, he took great interest in municipal politics, was elected mayor of Holborn, and gave valuable service to that great borough out of his personal knowledge of the administration of public health, especially in relation to the welfare of children. In 1894 he presided at the Congress of Public Health in London, in which year he was first elected President of the Institute of Public Health, a position which he held for ten years. In 1910 he was elected vice-chairman of the old Metropolitan Asylums Board, of which he had been a member for a long period, and in 1918 he was Sheriff of London, receiving the honour of knighthood. In that year he stood unsuccessfully as an Independent for the Parliamentary representation of the universities of St. Andrews, Glasgow, and Aberdeen.

From early days Sir William Smith was interested in military matters, and as far back as 1887 was a member of a War Office departmental committee. In 1908, on the creation of the Territorial Force, he became a major, and during the war served as a special sanitary officer with the rank of colonel R.A.M.C.(T.). Into his military duties he threw the same enthusiasm that marked his other official and municipal work, and during all the later phases of his life his energy triumphed over the disabilities of failing health. Holding so many public posts it was inevitable that he should be the recipient of many acknowledgments of his work. He was widely recognised on the continent as an authority on public health, and was the recipient of decorations from the French, Greek, Rumanian, Belgian, and Italian Governments, while he had honorary degrees from the universities of Athens, Geneva, Padua, and Ghent.

One intimately acquainted with both his work and personality writes of Sir William Smith as follows: "William Smith set himself to create (in effect) the national statutory and official basis, facilities and organisation for the system of public health diplomas, training, and appointments which we know to-day. He succeeded. Instant upon that hard-won success there flashed upon the mind of the creative artist a vision of the immeasurable future, national and international, for preventive medicine and public health progress. And, with that vision, William Smith must clearly have seen himself as, of necessity, one of the world leaders in that progress. For England led the world in the domestic sciences. In 1886 he founded the Institute of Public Health. And through the 46 years that followed founder and Institute were one and indivisible. It is no more than the simple truth to assert that, during those years of social revolution, there has been no single episode of progress in public health work that the Institute did not itself initiate or did not actively further and support. Even the creation of the Ministry of Health was mainly due to the persistent efforts of William Smith. Of the perseverance, the mental and physical vigour, the dominating personality, the knowledge of men and matters, these and other factors that made the result possible no casual record can tell. From first to last he was a great fighter. His ideas were new, and the English fear and, therefore, hate novelty. And it was actually within the past two years that, with his advanced age, he accomplished perhaps his most remarkable achievement. Faced with the compulsory demolition of the Institute premises he found, secured, and paid for a near-by plot of freehold land, and only just failed to witness the imminent opening of the new building."

Sir William Smith was twice married. His son by the first marriage is Mr. Corbett-Smith, the well-known publicist and musician. In 1913 he married for the second time Miss Frances Wheeler, J.P., Lady of Grace of the Order of St. John of Jerusalem.

GEORGE BROWN HILLMAN, M.B.E., L.M.S.S.A., J.P.

WE regret to announce the death on March 19th of Dr. G. B. Hillman, Member of Parliament for Wakefield. He had been lying ill for some days in London with bronchitis, when death took place suddenly from heart failure. George Brown Hillman was a son of the late Rev. S. D. Hillman, of Ilkley. He was educated at Ilkley High School, going on to the Leeds School of Medicine, where he took the Hardwick prize in clinical medicine and qualified L.S.A. in 1892. Soon after qualification he held resident appointments at the Leeds Hospital for Women and Children; he then started in general practice in the Castleford district of the West Riding, with sanitary charge of that and the Whitwood urban district, and became a steadily growing influence in local medical politics. In 1915 he received a commission in the R.A.M.C., reaching the rank of major in the Malta Command, where he was in charge first of the Spinola General Hospital and later of the Hamrun Military Hospital. On returning to Wakefield he soon became chairman of the West Riding local medical and panel committee, and was increasingly occupied in public work, becoming a member of the city council in 1926 and mayor of Wakefield in 1928. For a time he was chairman of the medical propaganda subcommittee of the British Empire Cancer Campaign. He first stood for Parliament at the general election of 1923, when he contested unsuccessfully the Normanton division. At the election in October last, standing for Wakefield as Conservative, he won the seat from Mr. G. H. Sherwood, another ex-mayor of the town. In 1895 Dr. Hillman married Christina, daughter of Mr. John Henderson, of Bradford.

DR. HILLMAN.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 12TH, 1932.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 76 (last week 41); scarlet fever, 1610; diphtheria, 818; enteric fever, 23; pneumonia,* 1929; puerperal fever, 42; puerperal pyrexia, 119; cerebro-spinal fever, 72; acute poliomyelitis, 1; polio-encephalitis, 1; encephalitis lethargica, 11; dysentery, 17; ophthalmia neonatorum, 112. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 15th–16th was as follows: Small-pox 110 under treatment, 6 under observation (last week 101 and 7 respectively); scarlet fever, 1453; diphtheria, 1551; enteric fever, 10; measles, 2048; whooping-cough, 400; puerperal fever, 23 (plus 9 babies); encephalitis lethargica, 226; poliomyelitis, 4; "other diseases," 196. At St. Margaret's Hospital there were 13 babies (plus 8 mothers) with ophthalmia neonatorum.

Deaths.—In 117 great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 81 (36) from measles, 8 (2) from scarlet fever, 46 (7) from whooping-cough, 24 (2) from diphtheria, 46 (14) from diarrhœa under two years, and 292 (59) from influenza. The figures in parentheses are those for London itself.

The deaths from influenza are dropping slowly. Of the great towns Birmingham stands highest with 21 deaths, followed by Bristol with 15 and Norwich with 11. The total deaths for the year from influenza so far amount to 3220, compared with 3504 for the corresponding period of 1931. The deaths from typhoid and paratyphoid fevers occurred in Eastbourne, Birkenhead, and Newcastle-on-Tyne. West Ham reported 6 deaths from measles, Ealing, Manchester, and Stoke-on-Trent each 4. Whooping-cough accounted for 6 deaths at Birmingham, 4 at Manchester. Diphtheria was credited with 4 deaths at Hull, 3 at Wakefield.

The number of stillbirths notified during the week was 312 (corresponding to a rate of 47 per 1000 births), including 47 in London.

* Now more accurately defined in the summary as Acute pneumonia (primary or influenzal).

PANEL AND CONTRACT PRACTICE

A Question of Prescribing.

THE London Panel Committee at its last meeting took exception to the report issued by the medical service subcommittee of the London Insurance Committee on a case relating to the prescribing of patent remedies. A man had contracted asthma on war service and was advised by the Ministry of Pensions to take a certain rather expensive proprietary preparation for the alleviation of this distressing condition. He purchased this for some time and then asked the Ministry to allow him some grant towards the expense, using the argument that if the Ministry can pay for the supply and repair of artificial limbs, necessitated by war injuries, why should they not help him to pay the cost of treating his own war injury—viz., asthma. This, however, could not be done, but he was told he could get the preparation through the panel. He thereupon consulted his panel doctor, without however actually asking him to prescribe the preparation on an insurance form. The doctor, it appears, would not have prescribed it because the formula had not been disclosed, and there was no special condition which would have justified him prescribing it when other and equally efficient remedies were available. These other remedies were in fact prescribed, and the patient admitted they had done him much good. He continued, however, with the doctor's knowledge, to obtain the proprietary article, and eventually appealed to the insurance committee for a refund of the cost. When the case came before the medical service subcommittee the doctor mentioned that one reason for not prescribing the article was its inclusion in the schedule of drugs or medicines drawn up by the Drugs Advisory Committee, the composition of which had not been disclosed. The Advisory Committee having expressed the view that the prescribing of such a drug could only be justified in exceptional cases, and that the justification would be difficult to substantiate, he thought he could not prescribe it without being surcharged. The subcommittee advised him that the responsibility was his own to decide, in any particular case, what was proper and sufficient medicine; and because a preparation was in a certain list (even drawn up by so responsible a body as the Drug

Advisory Committee) that was not in itself a sufficient reason for not prescribing it if, in his judgment, it was the proper form of treatment, other drugs not being equally efficient. This statement was issued "for the practitioner's future guidance," no ground for complaint being found against him. The panel committee regarded it as a "homily," and protested to the medical members of the insurance committee on the form of the wording which, whatever the strict legal position, seemed to take away from the doctor a useful argument for not prescribing a preparation when demanded by a patient who has great faith in it.

National Formulary.

There are in the National Formulary certain preparations of which the directions for use are printed with the formulæ; in the absence of any direction on the prescription, the chemist has to label the preparation according to this standard direction. If the practitioner writes directions himself, those directions take precedence over those of the standard formulary. But if he simply gives verbal instruction to the patient as to how the medicine should be used, the chemist puts on the bottle the formulary directions which may be different. Trouble is then likely to arise between doctor, chemist, and patient. The London Panel Committee, on the advice of its pharmacy subcommittee and after full discussion, decided to ask the Insurance Acts Committee to negotiate with the Ministry for the deletion from the Formulary of the printed directions.

Choice of Doctor.

The ethical subcommittee of the London Panel Committee has succeeded in persuading a hotel not to force its employees to go on the hotel doctor's panel. The hotel had issued a leaflet to its staff in the following terms:—

> Insured persons have the right of selecting their own panel doctor.
> It is, however, a great convenience to employees and to the company for employees to be on the hotel doctor's panel.
> Are you willing to transfer to this panel?
> (Write "Yes" or "No").....
> Signature .....

In reply to a request from the panel committee to deal with the matter, the Ministry stated they were not aware of any action that could usefully be taken. Eventually, however, the hotel representative asked what wording the panel committee would suggest, and the following was approved:—

> Insured persons have the right of selecting their own panel doctor. You are requested to make your selection from the doctors in the immediate neighbourhood at once.

Thus the free choice of doctor was maintained in this neighbourhood.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

A CROSS SECTION OF A DIABETIC HOSPITAL SERVICE.

WHAT is probably a fairly characteristic sample of diabetic careers under modern hospital conditions was given by Prof. Marcel Labbé in a communication to the Academy of Medicine on Feb. 9th. His cross section dealt with the year 1930, when 136 diabetics were treated in the wards of the Pitié, and 314 in its out-patient department. The in-patients for the most part represented a more serious phase of the disease than did the out-patients; a feature of the resident treatment was education of the patient in the technique of his own treatment. Patients who refused admission to hospital were coached by a social service worker in the graduation of their diets and the daily examination of their urines for glycosuria by Gerhardt's test. They were also taught the technique of insulin injections, and given printed instructions on how to avoid diabetic coma. Contact was maintained between these patients and the hospital through their visits once or twice a month to call for their insulin. The social worker who visited patients in their homes found them occasionally on the verge of coma, and brought them back to hospital and to life. In spite of surveillance and education, many patients died simply because they did not take the necessary trouble to live, and every summer holiday, away from home and supervision, yielded a crop of disasters. Among the 136 in-patients during the year there were 17 deaths, and among the 314 out-patients 20 deaths. Pulmonary tuberculosis was responsible for 24 per cent. of the deaths; diabetic coma and Bright's disease each for 13·5 per cent.; and infections and septicæmia for 10·8 per cent. The mortality from tuberculosis might be reduced by keeping the diabetic in a separate ward to which the tuberculous are never admitted, and by artificial pneumothorax treatment which, in Prof. Labbé's opinion, provides the diabetic's only chance of recovery. It says much for the modern treatment of diabetes that, while in Prof. Labbé's material only 13·5 per cent. of the deaths were due to diabetic coma, this condition was responsible for 60 per cent. of the deaths of diabetics in Naunyn's time.

PERI-ARTICULAR INJECTIONS OF NOVOCAIN IN TRAUMATIC ARTHRITIS.

Some interest has been aroused by the account given in the *Presse Médicale* for Feb. 20th, by Dr. R. Leriche and Dr. R. Fontaine, of Strasbourg, of the way in which a simple diagnostic device developed into what they now consider a valuable therapeutic measure. In March, 1930, one of them was engaged on a study of the sensory nerve-supply of the joints. He found that by the injection of an anæsthetic into the ligaments and insertions of tendons about joints, it was possible to dissociate purely mechanical ailments thereof from accompanying functional disturbances. Sometimes he was able to demonstrate the existence of functional disturbances which were alone responsible for symptoms and impaired movement about a joint. While engaged on the differential diagnosis of complaints of the joints, the authors observed an unexpected therapeutic effect of their injections. In every case in which the mechanical element was trifling, and reflex disturbances dominated the clinical picture, the functional improvement following these injections lasted much longer than the actual local anæsthesia; and when these symptoms occurred, they were, as a rule, much less pronounced than before. This led to the repetition of the injections four or five times, and to the complete disappearance of all the symptoms in certain cases of sprains and traumatic arthritis. Left to themselves, such cases sometimes clear up after a long period of stiffness, but functional defects often persist. Occasionally these cases end in veritable chronic arthritis deformans although, at the outset, according to the author, a complete cure could easily have been effected by peri-articular injections of an anæsthetic, a measure within the sphere of activity of every practitioner. They believe peri-articular infiltration is more satisfactory than intra-articular injection, and that

if an exquisitely painful point is found on palpation, it should be chosen as the site of the injection. If, on the other hand, there is diffuse pain, peri-articular infiltration should be extensive. From 10 to 25 c.cm. of a 1 per cent. solution of novocain (without adrenalin) are needed for each injection which may be repeated daily until recovery is complete.

A committee has been formed to collect subscriptions for the purpose of presenting a bronze medal to Dr. Charles Buizard, on the occasion of his promotion to the rank of Officer of the Legion of Honour. Dr. Buizard is the popular general secretary to the Surgeon's Society of Paris, and it is believed that many of his colleagues and friends in other countries will be glad of the opportunity to contribute to the cost of the medal, which will be designed by the well-known artist, Mr. Turin. Subscriptions should be sent to MM. G. Doin and Co., 8, place de l'Odéon, Paris (6e).

CORRESPONDENCE

THE PROBLEMS OF MARRIAGE.

To the Editor of THE LANCET.

SIR,—Public attention is being drawn to a subject which has long been of concern to the medical profession. Many troubles arise in marriage that could have been prevented by fuller knowledge. Some of these can be dealt with by a layman with special experience of marriage problems, whilst others are of a definitely medical nature which, if brought to light at an early stage and directed to the right medical authority, would respond promptly to treatment. Many marry with so little knowledge of its physiology that their future happiness is imperilled, for until recently such questions as the sex education of children and adolescents have received scant attention.

Recognising this fact for the last year, the British Social Hygiene Council has enlisted the help of a committee of experts in order that a handbook on preparation for marriage might be available. This work is shortly to be published by Messrs. Jonathan Cape.

But valuable though a book of this nature will undoubtedly be, there is no doubt that in many cases it is a personal consultation on an individual problem that is required. In order to meet this need, Mrs. Neville Rolfe, the Secretary-General of the British Social Hygiene Council and also of the committee for the preparation of this handbook, has been asked to establish a Personal Problems Bureau. This enterprise will be run on an economically self-supporting basis with the full support and approval of the Council. Consultations will be by interview and letter, for which it is proposed to charge a fee of £2 2*s*. for a personal consultation in London, and £1 1*s*. by correspondence. To all cases requiring medical assistance a list of authorities in the special field will be given to the client for submission to her medical adviser.

A private consulting room in Prince's Gate has been secured.

We are, Sir, yours faithfully,

KENNETH WALKER,
A. H. HARKNESS,
Honorary Medical Secretaries, British Social Hygiene Council.

London, S.W., March 16th, 1932.

ARTERIAL ATONY AND ARTERIO-SCLEROSIS.

To the Editor of THE LANCET.

SIR,—I greatly appreciate Prof. Plesch's courteous endeavour to reconcile my objections to his original statements; but in so doing he appears to me to introduce an elasticity of terminology which transcends reasonableness. I demurred to his assertions that athletes show marked calcification by the age of 35 or 40; that they are seldom capable of great physical effort when they attain middle age, and that most of them die before 50; and I assumed as the meaning of athlete that meaning which I believe to be in universal acceptance. It now appears that Prof. Plesch is referring to pathological subjects and to occupations which carry with them certain hazardous associations—e.g., copper-mining. That "big persons of excessive weight and height show a greater mortality than smaller persons" is surely an observation which will attract no contradiction. He instances the excessive mortality of 50 per cent. for stage acrobats which I am quite prepared to believe; but as regards the question under consideration one might as well draw conclusions about the malevolent physiological effects of high altitudes from the mortality-rate in parachute testers. The physical element in their lives may be trifling compared with the nervous strain inseparable from the dangers. Furthermore, the psychical disturbances of a somewhat precarious occupation with the anxieties attending unemployment and the hardships which necessarily result, have to be taken into consideration together with the possible influence of syphilis and of over-indulgence in alcohol and tobacco.

Prof. Plesch reiterates that the sharp rise of maximal blood pressure during work is certainly not without effect on the blood-vessels. It must be very difficult to assess the extent of any disadvantageous effect upon a *healthy* vessel. As a modest contribution to the problem I have to offer the examination of the radial arteries of three subjects with physical experiences which may be germane to the issue. The first, a man of 44, has indulged in violent exercise (running) regularly for 27 years. The second, aged 41, has been engaged in boat racing for nearly 20 years. The third, aged 42, following 14 years of competitive athletics, took very little exercise after the age of 32. Sections of their radial arteries have been pronounced as free from any pathological change by histologists whose judgment is beyond question. For obvious reasons it is impossible to collect a large number of subjects for such investigation, and I must risk the criticism that these will be discredited or deprecated as "exceptional."

I am, Sir, yours faithfully,

ADOLPHE ABRAHAMS.

Brook-street, W., March 19th, 1932.

TOURS TO RUSSIA IN 1932.

To the Editor of THE LANCET.

SIR,—In 1931 the Society for Cultural Relations arranged two tours in U.S.S.R. to enable scientists and doctors to see the present activities in science and medicine; 62 scientists and doctors, including several eminent specialists, joined these tours. The Society proposes to organise similar tours in 1932 but with a wider scope of scientific interests and subjects.

It hopes to arrange parties for physical, biological, and agricultural scientists, engineers, chemists, medical doctors, and anthropologists.

The parties will be limited to groups of about 20 persons; if the applications should exceed this number, two or more groups will be arranged. The travelling arrangements will be made by Intourist, Ltd., Bush House, Aldwych, London, W.C.2. The parties will be assisted by competent guides and interpreters provided by Voks, the Soviet organisation for cultural relations with foreign countries. The period of the tours will be between July 15th and Sept. 15th, and the inclusive cost of travel, accommodation, and guiding will be about £35, the tours lasting about one month, from departure to return to London.

We are, Sir, yours faithfully,

JULIAN HUXLEY,
P. CHALMERS MITCHELL,
E. RUTH MANSELL-MOULLIN
(Chairman).

1, Montague-street, London, W.C., March 16th, 1932.

SCHLAMM-FIEBER.

To the Editor of THE LANCET.

SIR,—The term *Schlamm-fieber*, as your editorial note to Dr. Parkes Weber's letter last week states (p. 644), is applied to a condition which may occur after drinking bad water. There is a certain amount of evidence that it is a leptospirosis due either to a specific leptospira pathogenic among the harmless water leptospiræ, or to the possible acquirement of pathogenicity by one of the latter. Zuelzer and others have shown that some of the water leptospiræ are pathogenic to guinea-pigs, and *L. icterohæmorrhagiæ* of Weil's disease can be contracted from infected water (see *Trop. Dis. Bull.*, 1931, xxviii., 315). Tarassow has recently reported cases in Moscow and its environs, and expresses the opinion that the leptospira in question is specific. It does not set up jaundice, but gives rise to symptoms which have, in the past, been mistaken for those of atypical typhoid and paratyphoid, toxic influenza, and even typhus—and reported as such.

I am, Sir, yours faithfully,
H. HAROLD SCOTT.

Bureau of Hygiene and Tropical Diseases, Keppel-street, W.C., March 18th, 1932.

TUBERCULOSIS IN CHILDHOOD.

To the Editor of THE LANCET.

SIR,—In both of the cases which Dr. Fletcher illustrates with serial radiograms there is no mention of the personal symptoms, and the X ray appearances in both are compatible with an unresolved pneumonic condition. As Drs. Toussaint and MacIntyre point out, radiology is a good servant but a bad master. Some of Dr. Fletcher's diagnoses are apparently based almost entirely on radiological findings. An exact interpretation of the chest skiagrams demands a careful consideration of the history, symptoms, and clinical signs in conjunction with the radiogram. The radiologist and the clinician should work together—the physician interpreting the physical signs which he has found in the chest, correlating them with the history and symptoms of the case and, finally, comparing them with the interpretation of the shadows which the radiologist finds in the skiagram. Then, and only then, can the diagnosis be fairly assured.

Dr. Kerley suggests a revision of the somewhat obsolete conclusions of the Committee of the National Tuberculosis Association of America. And I cannot fail to admire his suggestions, although I cannot altogether agree with the views he puts forward. With Dr. Blyth Brooke I would question if the recent advances in radiological technique "have really enabled us to discover with any degree of certainty the value of every pathological lesion in the chest which throws a shadow on the screen or plate." Most of us, I am sure, will be inclined to agree with him when he states that those with a clinical as well as a radiological experience will answer that it has not. I agree with him when he says that "many of the 'pneumonic conditions' in children described are either tuberculous or epituberculous in nature, with Koch's bacillus as a primary or secondary infecting agent, *but many are not*." His subsequent explanation confirms my own experience with numerous children examined and serially X rayed. It would appear that some of these cases do end in bronchiectasis or in chronic non-tuberculous pulmonary fibrosis.

I am, Sir, yours faithfully,
R. G. PROSSER EVANS,
Assistant Tuberculosis Physician, King Edward VII. Welsh National Memorial Association.

Grove-place, Swansea, March 21st, 1932.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS.

VETERINARY SURGEONS BILL.

IN the House of Lords on Thursday, March 17th, the Royal Assent was given to a number of Bills, including the Veterinary Surgeons (Irish Free State Agreement) Bill.

HOUSE OF COMMONS.

WEDNESDAY, MARCH 16TH.

Insanity and Divorce.

Mr. VYVYAN ADAMS asked the Attorney General if he would introduce legislation to facilitate divorce where one of the spouses had become insane after marriage.—Sir T. INSKIP replied: No, Sir.

Supply of Surgical Boots to Pensioners.

Mr. GORDON MACDONALD asked the Minister of Pensions what economy had been effected by withdrawing the supply of surgical boots from men suffering from shortening of leg due to war injury, and compelling the pensioner to buy ordinary boots and then send them to the Ministry for adjustment; and whether he would revert to the practice of the free supply of surgical boots and repairs to all pensioners whose legs were shortened one inch or more as the result of war injury.—Lieut.-Colonel HEADLAM (Parliamentary Secretary to the Ministry of Pensions) replied: There has been no such rule as that suggested in the last part of the question, nor has the supply of surgical boots been withdrawn. It has always been the duty of the responsible medical officer to order what was necessary either by way of modification of the man's own boots or, if this was not practicable, by the construction of a special boot, according as in his judgment was necessitated by the surgical requirements of the case, due regard being had to the appearance of the finished product. With the lapse of time, as the hon. Member will realise, the disability will in many cases have reached a final condition such as may no longer require the supply of a specially constructed boot. I am unable to say what saving may be effected in such cases.

Medical and Dental Services in the Navy.

Mr. PARKINSON asked the First Lord of the Admiralty how many dental officers, surgeon-captains, were employed in the Navy at a remuneration of £3 9s. a day; where they carried out their duties; and whether the duties were

purely of a supervisory character.—Sir BOLTON EYRES-MONSELL replied: There are no dental officers of the rank of surgeon-captain employed in the Navy at a remuneration of £3 9s. a day. One surgeon-captain (D) only is allowed in the establishment of dental officers, this officer being employed at the Admiralty on the staff of the Medical Director-General of the Navy, to whom he is responsible for the entire administration of the naval dental service. His duties necessarily include those of a supervisory character. His pay is at the current rate of £3 a day, plus the usual allowances.

THURSDAY, MARCH 17TH.

Women Workers in Factories.

Mr. THOMAS WILLIAMS asked the Home Secretary the number of women workers in the factories of England and Wales; the number of factories that might be inspected by his department; and the number of women inspectors available for inspection duties.—Sir HERBERT SAMUEL replied: Returns show that in 1930 there were 1,806,850 women and girls employed in factories: the figure for 1931 is not yet available. The number of registered factories at the end of 1931 was 155,354. There are at present 56 women inspectors in the divisional and district staffs. It would, of course, not be practicable to lay down any rule that factories where women only are employed should be inspected only by women inspectors.

Attacks on Women and Girls.

Mr. LEWIS asked the Home Secretary whether since the introduction of women police the number of cases of attacks on women and girls had a tendency to increase or to decrease.—Sir H. SAMUEL replied: Since women police were first employed, during the war, the reported numbers of some kinds of attacks on women and girls have decreased, while others have increased. Such fluctuations are due to various factors, and I am unable to suggest any direct relation between them and the employment of women police.

Medical Staff of the Ministry of Health.

Mr. J. A. L. DUNCAN asked the Minister of Health the number of salaried persons holding medical qualifications on the headquarters staffs of the Ministry of Health in March, 1925, and March, 1932.—Mr. ERNEST BROWN (Parliamentary Secretary to the Ministry of Health) replied: The numbers are 56 and 52 respectively.

National Health Insurance.

Mr. RHYS DAVIES asked the Minister of Health whether he proposed to introduce legislation to deal with the problems connected with national health insurance; and, if so, when.—Mr. ERNEST BROWN replied: The problems to which the hon. Member refers are receiving my right hon. friend's most careful consideration as a matter of urgency but he is not yet in a position to make any statement as to the introduction of legislation to deal with them.

Captain STRICKLAND asked the Minister of Health the reason for the present disadvantageous position of deposit contributors compared with contributors through an approved society under the National Health Insurance Acts; and whether he would consider an early amendment granting them equal privileges.—Mr. ERNEST BROWN replied: The National Health Insurance scheme has from the first been based on the provision of benefits to insured persons through approved societies, and the full advantages of the scheme can only be obtained through membership of a society. My right hon. friend sees no reason for amending the Act in this respect. The Act already contains special provision to meet the case of insured persons who, by reason of ill-health, are unable to secure admission to an approved society.

Training of Midwives.

Lieut.-Colonel FREMANTLE asked the Minister of Health the total amount of grants disbursed by the Ministry during the year ended April 5th, 1931, towards the training of midwives; whether the grants were paid direct to training schools; and, if so, the number of pupils trained under such grants and the number proposing to practise as midwives and health visitors respectively.—Mr. ERNEST BROWN replied: The total amount of the grants disbursed by the Ministry during the year ended April 5th, 1931, towards the training of midwives was £21,363. These grants were paid direct to the training schools. The number of pupils in respect of whom grants were paid was 752, of whom 717 proposed to practise as midwives, and 35 as health visitors.

Lieut.-Colonel FREMANTLE asked the Minister of Health whether any regulations regarding the payment of grants for the training of midwives had been made under the Local Government Act, 1929.—Mr. ERNEST BROWN replied: No, Sir. The conditions governing the payment of grants for this purpose were settled and published in 1925, and were not affected by the passing of the Local Government Act of 1929.

Preservatives in Foreign Bacon.

Mr. THORNE asked the Minister of Health if he was aware that some bacon imported from America was cured in a solution of borax for preservation in transit; and what steps were taken by his department to ensure that bacon so cured was not harmful to the health of the consumer.—Mr. ERNEST BROWN replied: The importation of bacon cured with borax is prohibited under the Preservatives Regulations. My right hon. friend is not aware of any recent contravention of the regulations in this respect, but if the hon. Member will give him any particulars in his possession inquiries will be made.

MONDAY, MARCH 21ST.

Thames Floods Prevention.

Mr. MOREING asked the Minister of Health whether a decision had been arrived at with regard to the resumption of the work of the Departmental Committee on Thames Floods Prevention; whether it was expected that the committee would resume its sittings; and whether he would urge the committee to expedite its deliberations and issue a report at an early date.—Sir E. HILTON YOUNG replied: The question of the resumption of the sittings of this Departmental Committee is under consideration, and I cannot at the moment add anything to the reply given to my hon. friend on March 3rd.

Heavy Traffic in Medical Areas.

Sir JAMES REYNOLDS asked the Minister of Transport if he was aware of the annoyance caused by the use for heavy traffic of streets devoted primarily to the medical profession; and if he would consider taking steps to ensure that such streets be kept free of such traffic for the benefit of patients where there were alternative routes conveniently available.—Mr. PYBUS replied: I am afraid it would be impracticable to impose restrictions such as my hon. and gallant friend suggests.

Public Health Services in India.

Dr. MORRIS-JONES asked the Secretary for India whether any decision had been arrived at regarding the proposal to abolish the post of director of public health in the United Provinces and to amalgamate the public health department with the medical department under the inspector-general of civil hospitals.

Lieut.-Col. FREMANTLE asked the Secretary for India whether any decision had been made regarding the proposal to abolish the post of director of public health in the United Provinces and to amalgamate the public health department with the medical department under the inspector-general of civil hospitals; whether he would state the reasons for and against the proposal; and in what way it was proposed to safeguard the health of the people not in hospital.—Sir S. HOARE replied: I have not heard of any such proposal as regards the United Provinces. Perhaps my hon. friends are referring to the Central Provinces where a proposal to combine temporarily the posts of director of public health and the inspector-general of civil hospitals is under consideration as a measure of economy.

Duties of Medical Staff of Ministry of Health.

Sir CHARLES CAYZER asked the Minister of Health whether any of the whole-time members of his medical staff performed duties or held appointments other than such as were connected officially with his department for which they received emoluments not provided by the State.—Sir E. HILTON YOUNG replied: The answer is in the affirmative. I should, however, make it clear that the performance of any such duties or the holding of any such appointments (which consist of the delivering of occasional lectures or acting temporarily as examiners) are only allowable where they do not interfere with the regular duties of the position of an officer as a public servant, or with the public interest.

The Silicosis Scheme.

Mr. NEIL MACLEAN asked the Home Secretary what was the total sum paid out under the Various Industries (Silicosis) Scheme since the inception of the scheme for England and Wales and for Scotland, respectively.—Sir H. SAMUEL replied: I regret that separate figures as to the compensation paid under the Various Industries and Metal Grinding Industries Schemes, which are identical except as regards the processes to which they apply, are not available, but the total compensation paid under these two schemes during 1929 and 1930 was £46,783. I have no information as to the proportion paid in England, Wales, and Scotland respectively. The figures for 1931 are not yet available.

Mr. NEIL MACLEAN asked the Home Secretary if any steps were being taken by the Home Office to have plant installed

by the employers to prevent silicosis.—Sir H. SAMUEL replied: Much has been and is being done in this direction. Regulations to prevent silicosis have been made under the Factory and Workshop Act, 1901, for a number of industries, including the manufacture of silica bricks, the manufacture of cutlery and edge tools, and the grinding of metals and cleaning of castings, and a supplementary code of regulations for the pottery industry has recently been agreed with the industry, and will be brought into force very shortly. All these regulations include requirements involving the installation of plant to prevent inhalation of dust. Further, it is the general practice of the inspectors under Section 74 of the Act to require the provision of exhaust ventilation in any case where the workers are exposed to this risk. The prevention of silicosis in mines and quarries is a matter for the Mines Department.

MEDICAL NEWS

University of Oxford.

Wilbert Hurst Brown, B.M., has been elected to the Radcliffe travelling fellowship for 1932.

University of London.

At a meeting of the Senate, held on March 16th, Prof. Carl Prausnitz was appointed Heath Clark lecturer for the year 1932; Sir John Rose Bradford, F.R.S., has been re-elected vice-chairman of the University College Committee for the year 1932–33.

Royal College of Physicians of London.

At a meeting of the College on March 21st Lord Dawson of Penn was re-elected President.

Diplomas in ophthalmic medicine and surgery were granted, jointly with the Royal College of Surgeons, to the following:—

G. P. Barua, W. M. Box, T. N. D'Arcy, A. A. Al Rahim Fahmy, Kamala Ghosh, Andrew Grant, Y. M. Khan, Surendranath Mitter, ', M. Moffatt, G. E. Plowright, Alison L. Taylor, and E. H. Walker.

The College will be closed from Friday, March 25th, till Tuesday, March 29th, both days inclusive.

University of Liverpool.

At recent examinations the following candidates were successful:—

D.M.R.E.

J. P. Grieve, W. Griffiths, R. B. Guyer, P. T. K. Nayar, E. L. Rubin, J. S. Tomb, and Sylvia Wigoder.

D.T.M.

B. N. Bhandari, P. Dass, J. A. Doherty, and R. L. Portway.

D.T.H.

G. P. F. Bowers, A. Cathcart, T. K. Kurivila, I. C. Middleton, and H. J. H. Spreadbury.

D.P.H.

Part I.—F. J. H. Crawford, Rita Henry, E. D. Irvine, G. W. Paton, M. Solomon, and Honora J. Twomey.

University of Dublin.

At recent examinations in the School of Physic, Trinity College, the following candidates were successful:—

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Part I.—Materia Medica and Therapeutics; Medical Jurisprudence and Hygiene; Pathology and Bacteriology: •D. M. Mitchell, •R. B. Hunter, Mary E. Mansfield, George Hannigan, M. J. Roberts, J. S. Ruddell, Marion A. G. Kennedy, G. S. S. Harty, R. G. B. Wigoder, E. S. A. Ashe, W. P. Griffin, and G. N. Taylor.

Part II.—Medicine: D. C. Evans, J. G. Wilson, H. J. Garland, H. B. Wright, and M. A. Shapiro. *Surgery:* D. B. Bradshaw, H. S. Mason, L. L. Nel, A. J. O'Connor, H. J. Garland, Kathleen R. Byrne, T. J. O'Sullivan, Joseph Elliman, P. H. Peacock, E. S. Samuels, M. A. Shapiro, and Edward Morrison. *Midwifery:* •J. N. Concannon, •S. N. Varian, H. B. Wright, J. A. Mallie, W. M. E. Anderson, D. T. Annesley, W. T. Bermingham, and Elizabeth G. Graham.

• Passed on high marks.

Instruction for D.P.H.

A three-months' course of lectures and demonstrations on Clinical Practice and in Hospital Administration will be given at the Brook Hospital, Shooter's Hill, Woolwich, London, S.E.18, by Dr. J. B. Byles, the medical superintendent, on Tuesdays and Fridays at 3 P.M., and alternate Saturdays at 11 A.M. from Tuesday, April 5th. Further particulars may be had from the Medical Officer of Health, London County Council, Public Health Department (Special Hospitals), Victoria Embankment, E.C.4.

Royal Sanitary Institute.

A sessional meeting will be held at York, in conjunction with the Yorkshire branch of the Society of Medical Officers of Health and the North-Eastern Centre of the Sanitary Inspectors Association, on April 1st and 2nd, 1932, when papers will be read on Medical and Social Conditions in Soviet Russia, by Dr. W. W. A. Kelly; on York's Experience with Tuberculous Milk, by Mr. Frank Fishburn; and on Non-pulmonary Tuberculosis in York, by Dr. P. R. McNaught.

Post-graduate Work at Dundee.

A course of lectures will be given at Dundee Royal Infirmary at 3.15 P.M. on Thursdays from April 7th to May 26th. The first, on Gastric and Duodenal Ulceration, will be given by Dr. W. E. Foggie and Mr. John Anderson.

London Hospital Medical College.

The subject chosen for the Hutchinson triennial prize dissertation for 1935 is Septic Infections of the Hand, with special regard to the End Result. Particulars will be found in our advertisement columns.

Elizabeth Garrett Anderson Hospital

Last year there were 2893 in-patients, an increase of 95, and 7492 out-patients. Although there was a deficit of £1564, the income increased by £1166 and the expenditure fell by £514.

Higgins Memorial Sterilising Room at Louth.

As a memorial to the late Dr. W. R. Higgins, a new sterilising room has been provided in the Louth District Hospital. Dr. Higgins, who died on August 22nd, 1930, was for 24 years honorary medical officer of the institution and a very popular surgeon in the town. The sterilising room, which cost about £250, has been provided by public subscription, and the equipment in it is the gift of the management committee of the hospital. The opening ceremony was performed by Major E. F. Finch, F.R.C.S., who said that in providing this addition to the hospital they were fulfilling one of the greatest desires of Dr. Higgins's heart. A vote of thanks to Major Finch was proposed by Dr. Laughton Smith and seconded by Colonel L. P. Stephen, honorary surgeon to the hospital.

Medical Superintendents' Society.

The annual dinner of the Society was held on March 19th at the Langham Hotel, London. Some 75 members and guests were present, the President of the Society, Dr. J. Basil Cook, being in the chair. The health of the Society was proposed by Dr. H. L. Eason, and responded to by Dr. Cook, who outlined the part the Society had taken during the past 45 years in the evolution of the municipal hospitals, and urged the importance of making their vast storehouses of clinical material available for medical students. The health of the visitors was proposed by Dr. Clifford Ellingworth and responded to by Dr. F. R. Seymour. Amongst the guests were Prof. W. W. Jameson, Dr. J. Tate, Dr. Allen Daley, Dr. Letitia Fairfield, Dr. James Neal, and Dr. J. W. Bell.

Irish Medical Schools and Graduates Association.

The St. Patrick's Day dinner of the Association was held on March 17th at the Piccadilly Hotel, London, Dr. Howard Humphris presiding over a gathering of the members and their friends. The feature of the evening was the presentation of the Arnott Memorial Medal of the Association to Sir William Taylor, the well-known Dublin surgeon, who is understood to have been largely responsible for the movement popularly known as the "Irish Sweeps," by which the hospitals of his country have so largely benefited. Mr. J. F. Peart delivered an eloquent justification of the selection of Sir William Taylor as recipient of the medal, touching briefly upon the "Sweeps," while pointing out that the Association was honouring one who had been president of the Royal College of Surgeons in Ireland, was consulting surgeon to several large Dublin Hospitals, and a pioneer in gastric surgery. Sir William Taylor, in a brief reply, pointed out that the distribution of the prizes had brought happiness to a great many, while there could be no doubt of the enormous importance to the medical charities of the large sums of money obtained. The toast of "the Guests" was also left in the hands of Mr. Peart, who coupled with it the name of the Envoy Extraordinary and Minister Plenipotentiary for Egypt. His Excellency briefly replied, when the toast of prosperity to the Association was proposed by Mr. Patrick J. H. Hannon, M.P., and replied to by Dr. Humphris. A short musical programme was provided, which consisted in the singing of appropriate songs by Miss Wynne Ajello and Mr. Dennis O'Neil.

St. Mark's Hospital.

In 1931 St. Mark's Hospital, City-road, for diseases of the rectum had its busiest year. The 885 in-patients, the 940 operations, and the 10,404 out-patient attendances were all the highest recorded.

Finances of Doncaster Infirmary.

This hospital is now in debt to the extent of £55,000, and Mr. A. A. Bell, chairman of the board of management, states that unless a large sum can be raised many beds will have to be closed.

Underground Fire at a Hospital.

The Stoke-on-Trent Infectious Diseases Hospital at Bucknall has had to deal with an underground fire in an outcrop seam of coal which is believed to have been burning for many years. It was discovered when the foot of a boiler fireman slipped through the floor of the power-house into hot cinders. The smouldering mass extended to a depth of 15 feet, and some hundreds of tons of burning cinders had to be excavated before safety was secured.

Donations and Bequests.

The late Mr. John Magee, of Preston, among other bequests, left £1000 to the Bolton Infirmary, £1000 to the Blackpool Victoria Hospital, and £500 to the Wigan Infirmary.—Under her will the late Miss E. Fullarton, of the Isle of Arran, has left some £30,000 for Glasgow charities, the larger part going to the Royal, Western, Victoria and Eye Infirmaries, and to the Ophthalmic Institution.

Hannah Dairy Research Institute.

Owing to the proximity of this institute to the West of Scotland Agricultural College's new premises at Auchincruive, Ayr, confusion has arisen as to the connexion between the institute and the college. To prevent further inconvenience it has been arranged that henceforth the postal designation shall be: The Hannah Dairy Research Institute, Kirkhill, Ayr.

Spa Treatment for Members of Friendly Societies

The scheme to enable members of friendly societies to obtain the benefit of spa treatment at the leading spas of Britain has now been completed by the British Spas Federation working in conjunction with the British Medical Association. The scheme has not been adopted as an additional benefit under the National Health Insurance Act, but will, however, be available from April 4th for all friendly societies who choose to adopt it for their members on the voluntary or non-State side. Staff insurance societies or similar bodies are, under certain conditions, also eligible for the scheme. The scheme provides for: (*a*) medical advice from a spa specialist; (*b*) a complete course of spa treatment; (*c*) accommodation, with board, in an approved hostel. Transport arrangements must be made by the patient or by the friendly society on the patient's behalf. The inclusive cost will be as follows: for the specialist medical services, covering up to a period of three weeks, a fee of 21*s*., and afterwards 7*s*. a week; baths, waters, and other treatments, 18*s*. per week; contribution to medicine and examinations fund, 2*s*. per week; accommodation and board, 35*s*. per week. At each spa administration of the scheme will be in the hands of a joint committee representing the spa authority, the medical profession, and the friendly societies, with the spa manager as honorary secretary.

London Light and Electrical Clinic.

At the annual general meeting of the British Humane Association last week Lord Scarbrough, the chairman, reported an increase of expenditure over income at the clinic of £1761, including the debit balance from the previous year. Heavy expenditure had been incurred by the installation of a bacteriological laboratory and the provision of additional equipment and accommodation. The number of patients attending the clinic was 120,000, of whom close on 8000 had been treated free of cost, and the total treatments given were 67,000 in excess of the previous year. Sir Leonard Hill had been appointed general supervisor, in addition to his duties as honorary research director. Each department had its own medical officer, and, in addition, three visiting physicians had been appointed. The clinic had recently been inspected by the chief medical officer of the London County Council, and recognised as a centre for treatment of L.C.C. patients. It had also been inspected this month by the Ministry of Health. Sir Leonard Hill in the course of his report states that the light wards have been reorganised so that 12 patients at one time can be treated by long flame arcs, and 8 by mercury vapour lamps. In the bacteriological laboratory vaccines are made by killing the emulsions of cultured microbes by ultra-violet rays, in place of heat; in this way valuable properties appear to be preserved.

Royal Interest in Hospitals.

The Duke of York has laid the foundation-stone of a new wing which is being erected to commemorate the centenary of Huddersfield Infirmary. The scheme also contemplates the reconstruction and extension of the present main building to provide an additional 40 beds. The new block will comprise a casualty department, a small theatre, observation wards, and out-patient department with waiting hall and a café, an eye, ear, nose and throat department, and an orthopædic clinic. The cost is estimated at £70,000. The Duchess of York has formally opened a maternity wing of the Blaina and district cottage hospital in South Wales. To the existing 34 wards the new wings add nine beds and four cots.

Hospital Finance of Two Great Cities.

The two great hospitals of Birmingham, the General and the Queen's, and the General Hospital of Bristol are all in a serious financial position. In January a Birmingham appeal for £90,000, to which the Ear and Throat Hospital was joined, was issued, but it has produced something less than £27,000, and it is now being farther pressed. Not less than £50,000 is needed to free the General Hospital from debt; during the last ten years investments to the amount of £135,000 have been sold to cover deficits and pay for extensions. The Queen's owes the bank £20,000, and has sold £58,000 worth of free investments. Its difficulties have mainly been caused by the provision a few years ago of a new block of 120 beds to relieve the scarcity of beds in the city. The Birmingham and Midland Ear and Throat Hospital is losing at the rate of at least £3000 a year, and will be unable to go on for longer than another two years, when some wards will have to be closed. It is proposed to amalgamate the General and the Queen's, but the scheme is held up owing to the unfortunate financial position.—Bristol General Hospital is losing at the rate of £15,000 a year, has an overdraft of £30,000, and has sold invested funds to the amount of £20,000. It is officially stated that unless the income rapidly improves some of the wards will have to be set aside for paying patients.

Medical Diary

SOCIETIES.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, Rembrandt Hotel, Thurloe-place, S.W.
FRIDAY, April 1st.—7.15 P.M., Discussion on Fœtal Pathology. To be opened by Mr. W. McAdam Eccles and Prof. Tom Hare.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.1.
MONDAY, March 28th, to SATURDAY, April 2nd.—CHILDREN'S HEART HOSPITAL, West Wickham, Kent. Sat., April 2nd, from 10.30 A.M. to 12 noon, Dr. Bernard Schlesinger: A Demonstration of Rheumatic Infection and Heart Disease in Children. Apply Fellowship of Medicine by March 30th.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.6.
MONDAY, March 28th.—Closed.
TUESDAY.—9.30 A.M. to 1 P.M., Operations, Medical Ward Visit, Surgical Demonstration, Dental Department. 2 P.M. to 4 P.M., Operations: Medical, Surgical and Throat Out-patients.
WEDNESDAY.—10 A.M. to 1 P.M., Medical Ward Visit. Children's Medical Out-patients. 2 P.M. to 4 P.M., Gynæcological Operations. Medical, Surgical, and Eye Out-patients. 4.45 P.M., Venereal Diseases. Demonstration.
THURSDAY.—10 A.M. to 1 P.M., Neurological Out-patients. Fracture Demonstrations. 2 P.M. to 4 P.M., Operations. Medical, Surgical, Genito-Urinary and Eye Out-patients.
FRIDAY.—10 A.M. to 1 P.M., Medical Ward Visit. Skin Out-patients. Dental Department. Medical Lecture. 2 P.M. to 4 P.M., Operations. Medical, Surgical, and Throat Out-patients.
SATURDAY.—9 A.M. to 1 P.M., Throat Operations. Medical Ward Visit. Surgical and Children's Medical Out-patients.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.
WEDNESDAY, March 30th.—4 P.M., Mr. H. L. Whale: Sinusitis and the Common Cold.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, April 1st.—4 P.M., Mr. C. Gill-Carey: Diagnosis of Sinusitis.

SALFORD ROYAL HOSPITAL.
THURSDAY, March 31st.—Dr. W. R. Addis: Demonstration of Gynæcological Cases.

WESTERN INFIRMARY, Glasgow.
WEDNESDAY, March 30th.—4.15 P.M., Mr. W. A. Campbell: Surgical Cases.

NOTES, COMMENTS, AND ABSTRACTS

SIMPLE CAUSES OF URINARY DISEASE AND THEIR TREATMENT.*

BY R. KENNON, M.D. LIVERP., F.R.C.S. ENG.,
LECTURER IN PRACTICAL SURGERY IN THE UNIVERSITY OF LIVERPOOL.

SCALDING, frequency, and dribbling, popularly known as "weak bladder," are perhaps the commonest urinary complaints, occurring especially in women of all classes and associated with much quiet suffering and unnecessary despair. The causes are simple and may be divided as follows:—

I. *Affecting the bladder*, such as modesty, neglect, office work, and excess of fluids.

II. *Affecting the kidney*—namely, shortage of fluids or water excess, motoring, fruit, infections, purgatives, and the hexamine compounds.

Modesty affects both sexes equally. Failure to answer a desire to empty the bladder may result in poor flow, in spite of the large volume present, and in straining, which ought always to be avoided. Acute retention may result at all ages without pre-existing disease.

Neglect is seen in the nursery, especially if the simple routine of hand-washing is in abeyance. Perhaps it is the running water or, more likely, the cold that initiates micturition, for nature has arranged the greatest number of cold spots in the hypogastrium—stimulated by every good nurse who blows gently on the lower abdomen of the refractory baby. A cold urinal and a warm bedpan are helpful to the adult.

Neglect may occur at school, where the timid child, after two cups of milk on a cold morning, hangs on with its pallid face and abdominal discomfort, in fear or by instruction, until the interval. Again, modesty with neglect takes its toll amongst the typists sitting long hours at the desk. These girls fall into the hands of the proctologist, urologist, or gynæcologist according to the whim of their general practitioner, in whose hands they might receive the best treatment if he would recognise that pelvic congestion is the common factor, producing in the rectum, even when empty, a sensation of fullness, indistinguishable, so far as the patient is concerned, from constipation. The diverse symptoms yield to simple remedies, including the cold bath in the morning and a mile walk at lunch time.

Neglect under direct medical supervision often takes place. Far too frequently cystitis is reported in cases leaving hospital or nursing home, incorrectly attributed to a dirty catheter, the truth being that the catheter has not been passed soon enough. Many, especially women, cannot empty the bladder when in bed, even in health, much less so when ill, be their illness medical or surgical. It is useless to rely on the report of the nurse that the patient has passed urine; it is our duty to inspect, palpate, and percuss the hypogastrium for a distended bladder in all bedridden patients. It is imperative, moreover, that a catheter should be passed if the surgeon intends to make a mid-line subumbilical incision or may have to on account of pus in the pelvis.

EXCESSIVE FLUID INTAKE AND PERSPIRATION.

Excess of fluid intake—tea, beer, &c.—can produce the weak bladder which masquerades in the literature as atonic bladder, cystitis, trigonitis, or prostatism.

Ten years ago I had to test a young man for matrimonial purposes as to the cure of a very doubtful gonorrhœal infection. He reappeared recently with pain in the left vas and testicle, general lower abdominal discomfort, and a swollen feeling above the pubis. Naturally I concluded that he had had gonorrhœa, and was now suffering from stricture. I asked him to pass water, and obtained nine ounces of strong and slightly turbid urine. I chatted about his wife and family, and ascertained that she was healthy and had produced two healthy children. With a soft rubber catheter I then obtained half an ounce of urine, and a 10/13 bougie passed easily. He follows a sedentary occupation, yet consumed eight pints of beer and tea daily—three after 8 P.M.—hence the necessity to get up two or three times at night. A month later he was in excellent health, after curtailing fluid intake and on two-stage micturition.

It is our duty to recognise the simple and almost insignificant beginnings of bladder disease, and to discourage those who proudly announce that their bladder never troubles them, and that they can go without emptying it all day and frequently do so. They are candidates for serious disease.

In all occupations associated with profuse perspiration—in the mine, stoke-hole, harvest field, glass works, and operating theatre—backache and cramp are common complaints. Sweat contains much salt, and hence the blood becomes deficient in salt. If a saline drink is administered—even grs. 10 of salt to the gallon has sufficed—the backache and other symptoms disappear. The mother who forbids her children to quench their thirst with cold water on a hot day has now a scientific reason for her whim: she is preventing water poisoning.

A short while ago I received a cable, "Arrange operation. Stone in kidney." On arrival my patient gave a history of renal colic followed by smoky urine, and presented two normal uroselectan pyelograms. Cross-examination showed that no radiogram had been taken prior to the intravenous injection of the drug, and Dr. R. E. Roberts reported no stone shadow. This after a voyage of over 2000 miles! He was a marine engineer, and his sweat would run eight feet across the deck when he came up from the engine-room in the tropics. He had 1½ ounces of residual urine, but could take a 10/13 bougie easily. Here was renal congestion causing backache, colic, and hæmaturia, and also an atonic bladder produced by the large fluid intake demanded by the patient to quench his thirst.

Motoring affects the kidney in a curious way: the vibration produces renal congestion, from which hæmaturia and albuminuria may result.

A girl of 14 travelled from London to Liverpool by motor-bus, the cheapest way. That evening she had a well-marked hæmaturia with casts of red cells. In three days all was well and, armed with a negative radiological report, she sailed for America.

Other cases might be quoted. How far the headache, nausea, and vomiting associated with travel by air, train, and car are of renal origin is an interesting subject for investigation.

Attention to the amount of fruit consumed by the patient will often solve a renal problem. Prof. Thelwall Thomas taught us to expect attacks of renal colic in children on fruit farms in Cheshire. Some children will wet the bed after lemonade, and rhubarb has always been suspect. Seven years ago a medical man consulted me for dysuria and frequency. In answer to a recent inquiry he writes:—

"I have had periodic attacks ever since, but am now satisfied that the symptoms are mainly due to transient oxaluria associated with diet. I am, and always have been, very fond of fruit, and frequently eat four apples and perhaps a couple of oranges a day. This will, within eight hours, induce definite frequency and occasional mild dysuria, backache, &c. Such symptoms pass off in about 12 hours, until the next time I indulge in fruit, tomatoes, &c."

What is the origin of this oxaluria? Does the oxalic acid content of the fruit appear in the urine, or does the fruit produce an intestinal irritation which, resulting in an increased absorption of toxins or organisms from the bowel, stimulates the kidney to produce its own oxalic acid, the main chemical found in renal calculi throughout the world? If the latter, it is only natural that McCarrison, in India, and Dr. Edna Mawson in this country, in her yet unpublished

* Based on an address to the Liverpool Medical Institution.

but important thesis, should direct our attention to the rôle of diet in the production of urinary calculi.

Bed-wetting by children in institutions can be eliminated by limiting fluid intake immediately before bedtime, and giving extra blankets in cold weather. It can be enhanced by allowing the children to sleep on a cold mackintosh covered by a single sheet, the cruel routine of most hospitals in the country to-day.

THE RÔLE OF INFECTIONS.

Infections of all kinds play their part in the beginning of urinary disease, and a free fluid intake of milk, water, and salines should therefore be tried, with alkalis, by all who treat febrile conditions.

Less appreciated is the part played by drastic purgation. Recently a patient was sent to hospital as a case of acute appendicitis, and on inquiry she confessed to taking half a bottle of cascara and several other purgatives. Intestinal colic had followed, with a bacilluria so brisk that the kidneys bled profusely. Under alkalis and rest the appendicitis did not mature, though many an attack of appendicitis has been caused by the homely over-dosage of a purgative. Transient albuminuria, bacilluria, and hæmaturia are so often present in appendicitis that there is sometimes danger of delay in removing this dangerous organ. The chances of operating upon a normal appendix and leaving a gangrenous kidney are so remote that the description of such an accident might well be left to urological journals.

In all cases of frequency with temperature and the associated symptoms the diagnosis may be one of pyelitis, but it is our duty to ascertain whether the infection is primarily renal and hæmatogenous —a descending infection—or whether the infection is reaching the kidneys along the lumen of the ureter from the bladder: the ascending pyelonephritis or surgical kidney of former days. The hæmatogenous origin of renal infections has been over-written, but more and more evidence is accumulating in favour of equal acceptance of the ascending and descending origins. Cunningham and Graves [1] have demonstrated the ease with which regurgitation occurs from the bladder to the kidney in the anæsthetised animal, and quote Kretschmer, who in 1916 found regurgitation in three out of ten children under ether anæsthesia and considered straining a factor. To-day we find the radiologists pressing on the bladder in order to obtain a better renal picture in intravenous pyelography—so much for the efficacy of the lower end of the ureter as a sphincter! If the unilateral nature of pyelitis has been exaggerated, so also has the bilateral nature of ascending infections. Unilateral pyelitis may be secondary to cystitis—most often on the right side.

A man, catheterised three days previously for vesical congestion, suddenly developed pain and a swelling in the right loin so large that I thought an operation necessary, but Mr. Thomas in consultation wisely remarked: "The kidney is not an appendix; it will stand a lot of tension. Wait a few days and see what happens." I did, and after about a week the swelling subsided, never to recur during the remaining four years of the patient's life.

In primary renal cases, often with recognisable foci of infection, alkalis produce dramatic cures. Carbonate of soda is again displacing citrates, which are often nauseating in large quantities but are more palatable when prescribed as an effervescing tablet. Their administration should be continued for 14 days, after which sodium acid phosphate is indicated. Or, of course, the latest urinary antiseptic may be given, a careful watch being kept for any recurrence of scalding or frequency. Mercurial compounds should be avoided.

VALUE OF INSTRUMENTATION.

Many cases become chronic and run alarming temperatures for five weeks or more. The patient, desperately ill and wasted to a shadow, is tested for typhoid and tuberculosis with negative results. Vaccines are prepared and a result is sometimes obtained, usually about the time the patient would normally be improving if left alone. We have all experienced these desperate cases. Some have yielded to catheter drainage, others are cured the moment they are cystoscoped, and so I was led to search my records for a cause of these unexpected and dramatic cures. My first experience really started my interest in dysuria.

In 1911 a woman presented herself with pain and frequency of months' standing, and by means of cystoscopy a solitary ulcer of the bladder (Hunner's ulcer) was diagnosed by Mr. R. A. Bickersteth. I was instructed to wash out the bladder next day with silver nitrate. I did this once, but caused so much pain that I had to desist. Next day she said she was better, and I left well alone. Two years later I heard that she was quite well and had had no recurrence of symptoms. How one irrigation of silver nitrate could cure an ulcer puzzled me; it has never done so outside urinary surgery.

Another case was one sent by Dr. Henry Cohen:—

The patient complained of long and tiresome dysuria; alkalis and vaccines had been useless, and a previous cystoscopy had been done. I reported the usual blurred mucosa, adherent flakes of pus, and œdematous ureteric orifices, with apologies for paucity of treatment. Imagine my surprise when the patient reported improvement a month later! The only difference in the treatment had been that I used the large operating cystoscope, while my predecessor had only used the small inspection instrument.

The truth was revealed: these cases were due to spasm of the neck of the bladder, and a big bougie would cure them; it has cured many since.

I was soon convinced by the arrival in the private ward of an anæmic and wasted lady with dysuria, who had consumed quarts of barley water and had had intensive alkalis and a vaccine. The pathological report of her turbid urine ran as follows: "The deposit shows a heavy deposit of pus cells and a few coliform bacilli. No tubercle bacilli present. Cultures show a free growth of streptococci. No *B. coli* grown after three days' incubation." Cystoscopy showed the usual appearances described above. Within three days the urine was clear, and she had remained well for four years.

The mechanical treatment of vesical and urethral spasm is the keynote in therapy. The dramatic cures obtained then fall into line with the cure of constipation after passage of the sigmoidoscope or by rectal bougies, and of cardiospasm by similar means. Treatment should therefore be directed to the prevention and cure of local spasm.

In the acute pyelitis with enlargement of the kidney so common in association with pregnancy, the indwelling ureteric catheter should be tried after simple measures have failed. If the catheter does not bring about improvement and operation is necessary, the renal pelvis should be approached through the renal substance without attempting to bring the kidney to the surface. Nephrectomy is rarely indicated.

Cases of pyelitis of vesical origin may be recognised by the history of neglect, absence of marked frequency, lower abdominal pain, and phosphaturia. The urine is neutral or alkaline, with the usual cloud of organisms. A strong smell is noticed by the patient or relatives, and is due to stagnation of urine.

TWO-STAGE MICTURITION.

The diagnosis can very often be established without the catheter or cystoscope, and cure can be obtained and recurrence prevented simply by two-stage micturition. Ask the patient to pass urine without straining, wait five minutes, and then ask him to try again; anything from one-half to several ounces is often obtained, to the surprise of all concerned. The residual urine so obtained is the origin of the chronicity of many urinary cases, the stale urine infecting the oncoming urine from the kidney and so creating a vicious circle. I owe this valuable procedure to Prof. Andrew Fullerton, and have found it of extreme value in early cases of enlarged prostate. We are taught that the prostate should be removed

[1] Cunningham, J. H., and Graves, R. C.: Surg., Gyn., and Obst., 1924, xxxix., 39.

when there is 2 oz. of residual urine, and almost in the same line we read that a catheter should be avoided lest infection be introduced. This paradoxical situation is solved by two-stage micturition, repeated every three hours during the day without straining; with no fluid intake after 8 P.M. Its employment by those in charge of antenatal clinics would diminish the urinary complications in pregnancy, and it would make unnecessary the catheterisation of something like 12 per cent. of hospital patients.[2]

In well-established cases of atonic bladder with several ounces of residual urine, the important object of avoiding overload and providing rest for the overstretched musculature can be attained by getting the patient to pass water by the two-stage method every two hours, day and night. Benefit has usually followed in three days, the bougie also being employed if necessary. Two and a half hours is allowed to elapse between micturition; after three days the period is increased to three hours, and finally the patient is allowed to rest six hours at night. On paper this looks a formidable procedure, but the discipline obtained is of value in the prevention of recurrence. These patients must always pass water in two stages and at three-hourly intervals if they are to remain well and escape uræmia at 55.

Severe cases of atony may require six-hourly catheterisation for the first few days. On occasion an indwelling catheter or suprapubic drainage has supplied the necessary bladder rest which, with abolition of sphincter spasm, spells cure.

MECHANICAL DISTENSION.

In late cases of "irritable bladder" and chronic cystitis without retention, to the spasm of the internal sphincter is added spasm of the whole bladder, and treatment has therefore to be directed to the abolition of these conditions by the big bougie and by gradual mechanical distension of the bladder itself. Daily by catheter and funnel a lotion is introduced into the bladder and retained for ten minutes. I start with 1 in 10,000 silver nitrate—that is, gr. 1 tablet of silver nitrate to one pint of distilled water, doubling the dose daily until stinging is experienced, then continuing with a lesser strength, normal saline being kept at hand to allay any pain produced by the lotion. Any bland lotion will do—it is the quantity introduced and not the antiseptic that matters. On the first day pain may be experienced with half an ounce and later with one ounce, and so on until at the end of a fortnight four ounces are held, and then the cystitic patient, no longer losing her sleep, becomes enthusiastic. We are then ready to institute some modification of the drill for atonic bladder with the two-stage method of micturition. I make no mention of bladder washes; it is bladder distension that counts. Just as in orthopædic surgery manipulation may start joint movement, so the amount of distension (four ounces) necessary for cystoscopy will give the necessary start to recovery. Over-distension, like over-manipulation, brings disaster.

After the daily distension with lotion of increasing quantity, a straight penile or small Hegar bougie is introduced to abolish spasm of the internal sphincter. If vesical spasm is intense, pain may be allayed by leaving one ounce of 5 per cent. old oil of cajaput in olive oil in the bladder. Gomenol or 10 per cent. emulsion of iodoform in tragacanth may be useful alternatives.

DIVORCE REFORM.

THE writer of a recent pamphlet on divorce reform suggests that the only way to compel immediate amendment of the law is for the medical profession to bring in a Bill of its own, "based solely on the grounds of the health and welfare of the nation, and avoiding all religious or controversial matters." The author, whose pseudonym indicates acquaintance with the legal side of matrimonial causes, paints a gloomy picture of the perjury, collusion, and connivance which, as he says, disgrace our divorce procedure. Here in brief are his proposed reforms. The following to be grounds for divorce—adultery, unnatural offences, non-consummation of marriage, chronic alcoholism, lunacy, syphilis, condemnation to penal servitude, and, finally, incompatibility of temperament. This last ground is to be discretionary, the judge to see the parties. Physical and moral cruelty would be included, also desertion, neglect of home and family, and dissolute living; where lunacy or disease is alleged, medical assessors to sit with the judge. The divorce, when granted, should be absolute, with no six months' delay; the office of King's Proctor should be abolished; the petitioner's adultery should be no bar to divorce; no damages should be awarded unless there are children, the damages to be paid into court and settled by the court on the children. The proceedings should be private and people of moderate means should be able to obtain a divorce in a county court for £30.

"The medical profession," writes the author, "to a man are in favour of reform, particularly on the ground of insanity." It is a cheery optimism which would suppose that the profession would be unanimous upon the contents of the proposed Bill or that "all religious or controversial matters" could be avoided.

MEDICAL NOTES FROM SPAIN.

A CORRESPONDENT in Madrid comments on some matters of interest to medical readers in present-day Spain.

A MUTUAL INSURANCE SCHEME.

Under the name "Previsión Médica Nacional" the medical profession in Spain, represented by various colleges which exist for purposes of medical defence, have elaborated a scheme of mutual assurance for the profession which it is hoped to bring into being before long. The aim is apparently to make it universal and obligatory, but there is no mention of any State supervision, though it is suggested that all doctors should join on leaving the universities after qualification. Its present activities are limited to two sections, health and life insurance, with four groups in each, differing only in the amount of their contributions and the benefits they may consequently expect. Everyone would have to join group 1 (the lowest) of the health section, and if he married the same in the life section. There will also be a benevolent fund taking 10 per cent. of the surplus funds and contributed to by the wealthier members of the profession which will deal with cases not otherwise eligible for benefit. The whole scheme is based on the practice of recognised insurance companies, but owing to the poverty of the majority of doctors in Spain the initial contributions and benefits are fixed very low.

INSPECTION OF PHARMACOBIOLOGICAL PRODUCTS.

Acting on a proposal of the Institute of Pharmacobiology, the Government has issued an order directing that all imported products in certain classes shall be liable to inspection by that body before being offered for sale. A very wide range of substances is included in the order, all vaccines, serums, and glandular preparations besides many drugs such as arsenobenzol and the like, ergot, oil of male fern and digitalis derivatives. Samples will be examined to ensure their purity and uniformity of composition before being admitted for sale in the country.

NAVAL SANITARY BOARD.

The reorganisation of the medical department of the Navy is being undertaken by the Minister of Marine and orders issued for the inspection of all matters of health and sanitation, whether as regards the personnel or the ships and naval buildings ashore. The instructions are under 12 heads, and include such matters as the inspection of hospital and hospital ships, the provision of a wholesome water-supply

[2] Mills, R. G.: Ann. Surg., 1924, lxxix., 813.

ashore and afloat, and the establishment of venereal clinics.

THE DIET OF GERSON.

This diet, the advocacy of which on commercial lines has caused it to be regarded with suspicion by the medical profession in Spain, has nevertheless been tried by many, on account of the results obtained by Sauerbruch and Hermannsdorfer. Good results have been observed in pulmonary tuberculosis, but a tendency was noticed to subsequent relapses (Nóvoa Santos, Carrasco Martinez). The best effects were seen by the dermatologists in lupus and especially in lupus of the mucous surfaces. Bejarano, Covisa, Fernandez de la Portilla, Saínz de Aja have all written to this effect. Better results are obtained in children than in adults and the most striking in the case of endonasal lupus. The diet is modified by the substitution of similar Spanish foodstuff for those prescribed and fortified with vitamin producing elements such as fruit juices and cod-liver oil. Fernandez de la Portilla narrates a case of a woman who after 20 years' treatment for tuberculous manifestations in the larynx, ear, and nose, which always relapsed, has remained free for six and a half months without any other treatment than the diet.

The Second Congress of Oto-Rhino-Laryngology will open in Madrid on Sept. 27th. The subjects chosen for discussion are oto-sclerosis, ozæna, and scleroma, and the three presidents of sections will be Duel (New York), Costiniu (Bucharest), and Belinoff (Sofia). Prof. A. G. Tapia is the president of the organising committee in Madrid.

Appointments

Hull Royal Infirmary: CORBETT, C. H., M.D. Edin., F.R.C.S.E., Hon. Surgeon; PATRICK, A., M.B. Edin., F.R.C.S.E., Hon. Assistant Surgeon.

Certifying Surgeons under the Factory and Workshop Acts: BROADHURST, H. C., M.B., B.S. Durh. (Modbury, Devon); LEIGH, H. V., M.D., B.S. Durh. (Bridgend, Glamorgan); and MERYON, C. E., M.B., Ch.B. Edin. (Alresford).

Vacancies

For further information refer to the advertisement columns.

Altrincham General Hospital.—Jun. H.S. At rate of £120.
Blackburn, Royal Infirmary.—Fourth H.S. £150.
Bootle General Hospital, Derby-road, Bootle, near Liverpool.—Hon. Laryngologist and Aurist.
Bradford, Royal Eye and Ear Hospital.—Jun. H.S. £150.
Brighton County Borough Sanatorium and Infectious Diseases Hospital.—Jun. Res. M.O. At rate of £150.
Burton-on-Trent General Infirmary.—Jun. H.S. £150.
Cardiff, Prince of Wales's Hospital for Limbless and Crippled.—Locum Tenens, Res. Surgeon. 4 gns. a week.
Cardiff Royal Infirmary.—H.P. and 2 H.S.'s to Spec. Depts. Each at rate of £50. Also Res. Registrar. £100.
Child Guidance Clinic, Tudor Lodge, 1, Canonbury-place, Islington, N.—Asst. Psychiatrist. £500.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.
Colchester, Essex County Hospital.—H.S. £175.
Dover, Royal Victoria Hospital.—Res. M.O. £180.
Edinburgh Royal Hospital for Mental and Nervous Disorders.—Asst. Physician. £300.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
Exeter, Royal Devon and Exeter Hospital.—H.S. to Spec. Depts. At rate of £150.
Freemasons Hospital and Nursing Home, 237, Fulham-road, Chelsea, S.W.—Surgeon Dentist.
Hospital for Sick Children, Great Ormond-street, W.C.—H.P. and H.S. Each at rate of £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.S. At rate of £75.
Ilford, King George Hospital.—Cas. H.S. At rate of £100.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. and H.P. Each £120.
Johannesburg Hospital, South Africa.—Radiologist. £1500.
Lancaster Royal Infirmary.—Sen. and Jun. Res. H.S.'s. £175 and £130 respectively.
Leamington Spa, Warneford General Hospital.—Res. H.S. £165.
Liverpool, Hahnemann Hospital, Hope-street.—Res. M.O. At rate of £100.
L.C.C.—Res. Asst. M.O.'s for Various Institutions. Each £250. Also Res. Asst. M.O. for Hammersmith Hospital, Ducane-road, W. £350. Also Visiting M.O. for Edmonton Colony, Edmonton, N. £200.
London Hospital, Medical College, E.—Hutchinson Triennial Prize, 1935.
London Lock Hospital, 91, Dean-street, W.—H.S. for Male Lock Hospital. At rate of £175.
Maidstone, Kent County Ophthalmic and Aural Hospital.—H.S. to Ear, Nose, and Throat Dept. At rate of £200.
Manchester, City.—Asst. Tuber. O. £650.
Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. At rate of £125.
Market Drayton, Joint Sanatorium.—Asst. M.O. £350.
Metropolitan Hospital, Kingsland-road, E.—Sen. and Jun. H.P.'s and H.S.'s. Also 2 Cas. O.'s. Each at rate of £100.
Miller General Hospital, Greenwich-road, S.E.—Hon. Asst. Surg. to the Genito-Urinary Dept.
National Temperance Hospital, Hampstead-road, N.W.—Surg. Reg. 40 gns.
Northampton General Hospital.—H.S. £150.
Paddington Green Children's Hospital, W.—H.P. and H.S. Each at rate of £150.
Prison Medical Service.—M.O. Class II. £350.
Queen's Institute of District Nursing, 58, Victoria-street, S.W.—Gen. Supt.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O £150.
Royal Naval Medical Service.—Vacancies.
St. Helens Hospital.—H.S. £200.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Anæsthetist.
Sheffield, Jessop Hospital for Women.—Hon. General Phys.
Sheffield Royal Hospital.—H.S. Also Res. Anæsthetist. Each at rate of £80.
Southend-on-Sea, New General Hospital.—Hon. Surg. Phys. &c. Also Pathologist. £500. Radiologist £500. R.M.O. £400. and Pharmacist. £350.
Western Ophthalmic Hospital, Marylebone-road, N.W.—Sen. Res. and Jun. Non-Res. H.S. At rate of £150 and £100 respectively.
West London Hospital, Hammersmith-road, W.—Hon. Med. Radiologist.
Winchester, Royal Hampshire County Hospital.—H.S. and H.P. Each at rate of £125.
Worcester County and City Mental Hospital, Powick, near Worcester.—Sen. Asst. M.O. and Deputy Med. Supt. £600.

Births, Marriages, and Deaths

BIRTHS.

BUTLER.—On March 17th, at "Crow's Nest," Orpington, the wife of M. Kempston Butler, L.D.S. R.C.S. Eng., of a daughter.
GILMER.—On March 18th, at Rodenbury, Hertford, the wife of Dr. H. S. H. Gilmer, of a daughter.
MARSHALL.—On March 10th, at Bournemouth, the wife of Charles W. Marshall, M.D., of Sturminster Newton, Dorset, of a daughter.
TOWNSEND.—On March 17th, at Welbeck-street, W., the wife of Dr. C. Geoffrey Townsend, of Mowbray, Beaconsfield, Bucks, of a daughter.

DEATHS.

DISTIN.—On Friday, March 18th, at Moorlands, Paignton, Howard Distin, M.B. Lond., M.R.C.S., L.R.C.P., aged 66 years.
HANNA.—On March 14th, at Exmouth, George Henry Hanna, M.D. Edin.
SMITH.—On March 17th, suddenly, in London, William Robert Smith, Colonel, R.A.M.C. (ret.), Knight Bachelor, M.D., D.Sc., LL.D., Emeritus Professor of Forensic Medicine in the University of London, Founder, President, and Principal of the Royal Institute of Public Health, aged 82.
TURNER.—On March 18th, at 73, Onslow-gardens, Muswell Hill, Nathaniel Henry Turner, M.R.C.S., D.P.H. (formerly of Edgbaston and Highbury-grove, London), second son of the late Frederic Turner, of Nizels, Hildenborough, in his seventy-second year.
WHITCOMBE.—On March 13th, at Nice, of heart failure following an operation, Philip Percival Whitcombe, M.B. Lond., aged 73.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES.—At the annual meeting last week it was reported that this institution which, when it was founded in 1884 treated some 600 patients in a year, is now treating 400 out-patients in a day, and that more than 100 forms of skin disease are being dealt with. The Manchester public health committee has accepted it as an approved centre for the treatment of skin disease, and the out-patients' department is now entirely inadequate. Many patients are paying towards the cost of their treatment, but more than 90 per cent. of the men and 30 per cent. of the women are panel patients. Dr. Louis Savatard, one of the honorary physicians, pointed out that without a voluntary hospital of this kind it would be difficult for panel patients suffering from skin diseases to receive efficient treatment.